# BULLETIN

## MADRAS DEVELOPMENT SEMINAR SERIES

VOLUME II NUMBER 10 OCTOBER 1972

74, SECOND MAIN ROAD, GANDHINAGAR,
ADYAR, MADRAS-20.

# MONTHLY BULLETIN

Vol. II No. 10

CONTENTS

| | | Page |
|---|---|---|
| Editorial—Some Highlights | ... | 1 |
| Science and Religious Values<br>*By Dr. C. M. Abraham* | ... | 35 |
| Growth—Its Imperatives and Limits | ... | 55 |
| Book Review | ... | 63 |

# EDITORIAL — SOME HIGH LIGHTS

## General Economic Scene

### State

*Perspective Plan*: The Chief Minister presented to the legislature on August 25th the Draft Perspective Plan Frame for Tamil Nadu (1972-1984) (See Vol. II No. 6 of the Bulletin for a summary of the Frame). The Draft presented to the legislature expressed all monetary factors in 1970-71 prices. The revised size of the Fifth and Sixth Plans at 1970-71 prices is:

| | Fifth Plan | Sixth Plan |
|---|---|---|
| | (Rs. in crores) | |
| State Plan (including Central assistance) ... | 1,300 | 2,600 |
| Central Sector ... | 1,000 | 2,150 |
| Private Sector | | |
| (a) Organised Sector ... | 150 | 300 |
| (b) Others ... | 750 | 1,050 |
| Total ... | 3,200 | 6,100 |

The Draft also makes a strong case for a fairer allocation of Central assistance to this State. The term assistance here is even more misleading than the term aid in international relations. Here we are dealing with sharing our common resources. The Bulletin will however conform to this current misleading terminology. The Frame points to the steadily diminishing share of Central assistance over the four Plan periods as follows:

| | Central Assistance (Rs. in crores) | | |
|---|---|---|---|
| | All States (1) | Tamil Nadu (2) | Percent of (2) to (1) |
| First Plan ... | 332 ... | 36 ... | 10.8 |
| Second Plan ... | 1,058 ... | 95 ... | 9.0 |
| Third Plan ... | 2,515 ... | 186 ... | 7.4 |
| Annual Plans ... | 1,763 ... | 119 ... | 6.8 |
| Fourth Plan ... | 3,500 ... | 202 ... | 5.7 |

This table shows the drastic decline in what is called Central assistance which has fallen from 50 per cent of the total Plan outlay of the State in the first two Plans to 39 per cent in the Fourth Plan. This must be corrected in the Fifth Plan. Even with increased Central assistance, the doubling of the outlays for the Fifth and Sixth Plans will call for unprecedented efforts in resource mobilisation in the State. For one thing the proposed investment pattern can be sustained only if the rate of savings in the State increases from the current 10 per cent to around 18 per cent in the Perspective Plan period.

A midway review of District Plan preparation by the 13 District Planning officers in August in the State Planning Commission Conference room showed that all officers have completed stages I and II of the planning methodology (See Vol. II Nos. 5 and 6 of the Bulletin). In the first two chapters which have now been drafted, the 26 development dstricts have been divided into 100 homogeneous sub-regions on the basis of common characteristics shown by the socio-economic data gathered at the block level. This has been a more laborious task than anticipated and there continue to be some gaps in the statistics collected, notably with regard to the sub-region's income. The second chapter is the assessment of the performance of the Fourth Plan projects for each sub-region. Here the problem has been the varying expertise of and the cooperation extended by the technical officers in the district. On this occasion, the secretaries of the fifteen Task Forces were able to present the Perspective Plan subjects recommended by each Task Force with particular relation to their relevance to the district plans and the sub-regions. In this manner the sectoral profiles emerging from the Task Force reports and the district plans are being interlocked.

The fifteen Task Forces are nearing completion of their work in preparing the sectoral profiles of the Perspective Plan. Three, (a) Education, Science and Technology, (b) Health, Family Planning, Nutrition and Sanitation and (c) Forestry, have presented their reports to the Chairman of the Commission (See Vol. II No. 9 of the Bulletin). On the basis of their work to date, the Planning Commission has undertaken an assessment of the Fourth Plan performance in the State and has established a list of priority projects for the Fifth State Plan amounting to Re. 1,300 crores. The Task Force programmes that had been proposed amounted to Rs. 1,900 crores and so the Commission undertook a pruning exercise of moving some Rs. 600 worth of projects into a second priority list. On this basis the State government will both indicate its position on the Approach to the Fifth Plan to the Union Planning Commission and negotiate with regard to the State outlay for the Fifth Plan. In establishing the Fifth Plan projects of Rs. 1,300 crores the Commission has been guided by three criteria: (a) meeting the requirements of the minimum needs programme: (b) generating employment: and (c) promoting growth. Each Fifth Plan project has a special section indicating what employment generation it will give rise to.

Another task being undertaken by the Planning Commission in response to a request from the Union Ministry of Science and Technology and the National Committee on Science and Technology is the compilation of a shelf of R and D projects recommended by the 15 Task Forces, together with the status of the projects as at the end of the Fourth Plan. The Task Forces have included in their reports 59 R and C projects amounting to Rs. 84.59 crores. In addition, the Annual Seminar on Consumer/User Oriented Research organised by the Madras Institute of Development Studies identified over 200 R and D projects for investigation during the Fourth and Fifth Plans (See Vol. I No. 9 of the Bulletin). This shelf of science and technology research projects are now being sent to the Union Ministry of Science and Technology so that it may be used by the National Committee on Science and Technology in the formulation of its Approach Paper to the Fifth Plan which will be issued simultaneously with the Approach Paper of the Union Planning Commission.

A further input in the Perspective Plan is the two techno-economic surveys being organised by the Commission in the two backward districts of the State–Dharmapuri and

Ramanathapuram. The Indian Institute of Public opinion Research which has been commissioned to undertake the Dharmapuri surveys submitted to the Commission its interim report which indicates the gaps in the available data—particularly in the area of dry farming as well as in communication and transportation. The survey which is working closely with the Dharmapuri District Planning cell will be completed in time to recommend both to the Commission and the District Planning cell the major investment possibilities in agriculture, irrigation, small and medium industries and communication so that the district can move forward rapidly during the Fifth Plan.

*Agrarian Reform*: The State government at the August session of the legislature has obtained approval or favourable consideration of 6 measures relating to Agrarian restructuration and reform.

Ceiling: As forecast in the last issue of the Bulletin, the legislature has passed the revised ceiling legislation at its August session in two bills. First the maximum holding for a family of more than five is now reduced from 40 to 30 standard acres, (a standard acre is equal to 0.8 to 4 ordinary acres in this State). Second the ceiling legislation will from now apply to 13 estates used as dairy farms or livestock breeding, as previous legislation had brought grazing fields and trusts, sugarcane lands and mill area under the ceiling. Third the compensation for surplus land acquired by the State will be on a slab basis, the amount decreasing with the increase in the size of the holding. As a result of the withdrawal of various exemptions, 1,49,200 acres become surplus land now available for distribution. Fourth the exemptions granted to religious institutions in respect of land held by them is to be extended to religious trusts of a public nature. The ceiling land owned by a college is 40 standard acres, high school 20 standard acres, primary school 10 standard acres) student hostel 25 standard acres, agricultural school 25 standard acres and orphanage 25 standard acres. These ceilings apply to existing holdings by public trusts or institutions which cannot acquire any additional land to equal the ceiling. The ceiling legislation is now both comprehensive and complex in the State and it is essential that the administrative machinery be geared to execute the various provisions promptly, with no let up in the rate and rhythm of agricultural production.

Agricultural Income Tax: In accordance with the concession on the State's agricultural income tax forced on the government in the farmers' agitation and its serious consequences referred to in the last issue of the Bulletin, the August session of the legislature was presented with the Tamil Nadu Agricultural Income Tax (Amendment Bill) which involved the following modification of the current Act, which the Raj Committee regards as a first effective measure in the Country to mobilise resources from the rural rich. The changes proposed by the Bill are (a) The exemption from agricultural income tax is raised to incomes of Rs. 5,000 as against the current limit of Rs. 4,000: (b) Those holding 10 standard acres will be exempted as against the limit of 7.5 standard acres at present, (c) At present those holding 50 standard acres or less were permitted composition of tax. The Bill provides for such composition of tax without any limit. At present while making assessment on escaped income, there is no provision for composition of tax. Under the bill, provision is made for composition of tax in respect of book assessment of escaped income. (d) Another concession is that for growers of grapes, sugarcane, groundnut and cotton (both irrigated), the present conversion of one acre into 3 standard acres will be changed to 2 or 1 acre when the water is from non-government sources. Banana lands in

hill areas are to be completely exempted and in other areas, bananas grown with government water will enjoy the conversion rate of one acre into 2 standard acres and one to one in the case of non-governmental water. (e) The agricultural income from trusts is to be excluded from total agricultural income. The bill is extremely complex to administer and its impact on the small farmer is unclear. Certainly the large farmers will gain. The Bill after a prolonged discussion has been referred to a Select Committee. It is hoped that the Committee will ensure a progressive fiscal measure which will benefit the small farmer. The Assembly also passed a bill (the Additional Assessment and Additional Water Cess Act) to tax assessed and unassessed waste lands (wet, dry and manavari) and poromboke lands. Taxes will be similar to that on patta lands.

Record of Tenancy rights : As forecast in the last issue of the Bulletin, the legislature passed the Tamil Nadu Agricultural lands Records of Tenancy Rights (Amendment) Bill under which all tenancy rights in the State will be recorded. Under this legislation, the recording officer is vested with the right to make all necessary enquiries on his own authority and prepare a record of tenancy rights in respect of any land let out for cultivation, if the landowner in intermediary or tenant fails to record the facts. Further such recording and enquiries by the officer will not be subject to examination by the courts—a currently delaying procedure. Also after the Assembly adopted legislation abolishing the Sreepadam land tenure in Kanyakumari District and the granting of ryotwari pattas to the farmers there, it also adopted legislation extending the Tenants Retention and Fair Rent Act to the Kanyakumari District. All this is leading to comprehensive legislation which will abolish all intermediaries on land in this State. Pass books recording the ownership are being issued to pattadars as a means of protecting the cultivators' rights and making difficult benami transfers of land by landlords to tenants to get round the ceiling legislation.

Wages, debt relief and modernisation work : The Agriculturalists Relief (Amendment) Bill was adopted by the legislature whereby all debts in cash and kind, secured and unsecured due by an agriculturalist are liquidated. (See Vol. II No. 6 of the Bulletin). Similarly the Debt Relief Bill reported by the Select Committee (See Vol. II No. 5 of the Bulletin) has been passed whereby if a debtor has paid his creditor twice the principal, the debt is regarded as discharged. If the repayment total is less than twice the principal, the balance only needs to be repaid. The interest payable is limited to 9½ per cent simple interest. Income tax assesses, professional tax assesses of more than Rs. 1,200 per half year and the agriculturalists under the Agriculturalists Relief Act do not benefit from this Act. There are ambiguities in regard to those to whom the Act does not apply which will need to be clarified by further amendments. Further to the problem of Thanjavur farm wages reported in the last issue of the Bulletin, the legislature has passed an amendment to the Tamil Nadu Agricultural labourers Fair Wages Act, making the Act permanent, empowering the government to alter and fix wage rates for different areas every five years on the basis of the available labour supply, price of essential commodities and the rise in the cost of living. The government helped to bring about an agreement on farm wages which for East Thanjavur will be six litres of paddy and Rs. 1.50 in cash or Rs. 3.70 for men working 8 hours a day (under the Ganapathia Pillai Commission it used to be 5 litres and Rs. 1.25 or Rs. 3) and five litres of paddy and 50 paise or Rs. 2.25 for women working 7 hours a day (compared to the previous 5 litres of paddy and 25 paise or Rs. 1.75). For West Thanjavur the agreement is Rs. 3.50 for men and Rs. 2.25 for women, the women,

with the payment of wages in kind during harvest time. As stated in the last issue, the time is now ripe for the regulation of farm wages throughout the State. For this the government is setting up a Commission to examine fair wages payable in each district on the basis of the three criteria set forth above. It should also be possible to introduce during the Fifth Plan a system of old age provisions similar to that existing for factory labourers. Incidentally such a provision would be a major factor in controlling the growth of the rural population. The modernisation programme of the Thanjavur irrigation system—the Cauvery and Vennar divisions—faces a number of initial difficulties all stemming from the local people's lack of understanding of the programme and their not being associated in its planning. The present irrigation practices in the district are heavily wasteful and the aim of the scheme is to make the water supply go further in increasing cultivation. This involves water being piped into the fields in a regulated manner and pipes also being used for draining the water. The kind of local problems encountered include the complaint that the local people should have been consulted (Thiruthurai Poondi Block), that silt clearance and deepening the Kidumaramuthu work should have been done by the local panchayats and not by the PWD (Pasupathi Koil), that the work was rushed in order to spend the money before the year and (Vanathirajapuram), that because of no follow up work, new irrigation difficulties are caused by the programme (Sembanar Koil) and so on. It is essential that this important programme should be a joint undertaking by the local farmers, the panchayat unions and the PWD technicians. Decentralised planning at the district and block level now under way should lead to similar decentralized execution of these important development projects.

***State loans and bank expansion*:** On September 4, 20 State loans for Rs. 197.25 crores were offered and Rs. 220.63 crores were subscribed. Against Tamil Nadu's notified amount of Rs. 20 crores, Rs. 22.10 was subscribed. Allowing for the repayments against maturing loans the net borrowing notified is Rs. 133 crores. The increase in the notified amount of loans are from States with large uncovered deficits. Thus Andhra Pradesh the bigger borrower asked for Rs. 20.50 crores as against Rs. 12.75 crores last year while Tamil Nadu asked for Rs. 20 crores against Rs. 19.75 crores last year. Tamil Nadu's maturing loan in Rs. 16.44 crores so that its net borrowing is Rs. 9.56 crores which is the largest among the southern States (Andhra Rs. 9.48 crores, Mysore Rs. 6.71 crores and Kerala Rs. 2.90 crores). The States' overall indebtedness to the Union government stands at the colossal figure of Rs. 6,780 crores as at 31st March, 1972, and the stage has now been reached for Tamil Nadu when the repayment of the principal and interest to the Union government exceeds what is called the inflow of central assistance. The pros and cons of this issue have been discussed in earlier issues of the Bulletin. The State for its part will be making all efforts to mobilise its own resources (the tragic episode of the power rates and agricultural income tax have to be overcome) and the irrigation, power and transport investment can and must be made to pay their way and repay their loans. The Sixth Finance Commission should recommend writing off the rest of the indebtedness of the State. It should also resolve the problem of the constant upward revision of salary and allowances of Central service and their effect on the State sources, and in this connection examine all non-development expenditures—both that of the State and of the Union government which stands at about Rs. 10,000 crores today. Bank expansion in the State is satisfactory. Next to Maharashtra, Tamil Nadu has the largest number of commercial bank offices in the Country. In the 2½ years since nationalisation of the banks—between July 1969 and the end of 1971, over 370 branches have been opened in the State. Of the

374 new offices opened, the majority (253) were in rural areas. The average population served per bank office is 29,000 in Tamil Nadu, compared to 47,000 in Andhra Pradesh and 42,000 for all India. This is a good development for the resource mobilisation awaiting the Fifth Plan for the State. It is also a significant means of the area approach to village development in the State. In the last issue of the Bulletin, the development activities of the Central Bank and the Bank of India in six towns and villages were reviewed. The Indian Overseas Bank now reports on the development work in Kilathivakkam by its Acharapakkam branch in Chingleput district. The branch began its programme by giving Rs. 40,000 as crop loans to 60 farmers persuading them to use it for purchase of HYV seeds (IR 8, IR 20, IR 22) and fertilisers and obtained complete repayment from the ensuing harvest. This was followed by a larger loan programme to finance pumpsets, digging and deepening wells etc. As a result three crops are now grown in Kilathivakkam—, i.e. besides paddy, groundnut, gingelly, sugarcane, ragi and pulses and farmers' incomes have trebled. Per acre yields of paddy and groundnuts have doubled and fertiliser consumption has more than doubled. Full recovery of all loans are reported.

*Power :* On August 14, a system of integrated operation of the Southern Regional Power grid, referred to in the last issue of the Bulletin, was inaugurated at the headquarters of the Southern Regional Electricity Board, Bangalore. In the four Southern States there are 35 hydro electric power stations with an installed capacity of 2,983 MW, and eight thermal stations with a capacity of 545 MW plus Neyveli with a 600 MW capacity. Thus the Southern region has a total installed capacity, and a daily 4,135 MW which is more than 25 per cent of the Country's capacity, and a daily energy consumption of over 50 million units. To this should be added the Iddikki project in Kerala and Kalpakkam in Tamil Nadu. The integrated working of the generating capacity and transmission and distribution of available power in the Southern region is the first of its kind for the Country and of direct benefit to all the four States. It will minimise transmission losses, provide the system with stability, overcome problems encountered in satisfying peak hour demands, and may even cause a net increase in total generation through better use of our thermal and hydel capacity and so increase the supply and lower costs. This is only the start. From here we should proceed first to installing generating sets with large capacity so that the regional distribution of power can be permanent, second identifying the causes for transmission losses and the sub-capacity (40 per cent) utilisation of our thermal stations and taking corrective action and third moving forward to a national grid through connecting the regional grids.

Further to the power projects in the State referred to in Vol. II Nos. 6 and 8 of the Bulletin, 7 power generation and further distribution projects involving an investment of Rs. 35.53 crores are planned for the current year. They include (1) the Naduvattam Diversion Scheme costing Rs. 165 lakhs to increase the Pykara and Moyar generation by 69 million units, (2) the Cholatipuzha scheme generating 60 MW at a cost of Rs. 6.46 lakhs, (3) the Kadampari scheme with two 100 MW sets for reversible pump turbine generation, (4) the upper Thambaraparani scheme with the first of six 30 MW sets costing Rs. 600 lakhs, (5) the Nellithorai scheme with an installed capacity of 50 MW at a cost of Rs. 6.70 lakhs, (6) the Panalayar scheme with 30 MW and (7) the Suruliyar scheme with a capacity of 35 MW costing Rs. 6.56 lakhs. Five of these schemes with a total outlay of Rs. 25 crores and a capacity of 355 MW are still awaiting final clearance from

CWPC which should be expedited. The State Board also shows for the first time a balanced revenue budget, with Rs. 1,800 lakhs (Rs. 500 lakhs being outside the Plan). 7,600 villages will be electrified and 60,000 pumpsets energised during the current year. The need for speed in approval and execution of the projects is seen not only in relation to the problem of meeting the industrial and rural electrification needs of the State but also to make a success of the Southern regional grid. When five of the eight generators at Sharavathy in Mysore had to close down in August–September for repairs to the water conductor system, Tamil Nadu which had planned to provide Mysore with the power it needed was unable to meet its commitment in full because of its own short supply situation. The delay in the rains added to the problem.

*Prices :* Prices in the State have continued to rise. The wholesale price index of food articles for July has increased by 49 points to 1,310 compared to June, mainly due to higher prices for rice, ragi, pulses, sugarcane, jaggery, oils, pepper, while non-food articles rose only by 8 points to 968 (Base August 21, 1939). There is really little reason for this rise in food articles in this State. The rise in the price of rice is in regard to the fine varieties and does not represent a hardship to the poverty sector, as high yielding and medium varieties have fallen by Rs. 5–10 per quintal compared to July 1971. Similarly the prices of cholam, maize, chillies and tamarind have declined. But edible oils, sugar and dhal and pulses have risen in price due to short supplies, transport bottle-necks and some speculative hoarding. Rice and sugar are being distributed through fair price shops to family card holders. Government stocks of rice, wheat and sugar are sufficient to prevent a rise in prices. It is edible oils and pulses which are causing unease and difficulties for the lower income groups and on this there is need for an all India programme of distribution and in the case of pulses, some imports in order to ensure fair prices for the poor section in the State and Country. In this context, it is necessary for the consumer societies to work closely with the farmers, businessmen and traders to prevent speculative price rises. Andhra Pradesh and the Northern States face real shortages and this State needs not only to maintain a stable price front but make available part of its rice supplies to the other needy States.

*Housing and Metropolitan Planning* : The 20 year 1971-1991 Madras Metropolitan Area Plan covers (a) the development of land in urban nodes, (b) traffic and transportation, (c) housing and slum clearance, (d) water supply and drainage and (d) social facilities including the development of the three satellite towns referred to in the last two issues of the Bulletin. The Plan is being executed in stages and the sectors where finance will be self generating is nearing completion. The sewage part of the Plan costing Rs. 13 crores involving a network of 1,003 kilometres of sewers covering an area of 50 square miles is being completed by the end of 1973. The sewage is treated and utilised for industrial and agricultural purposes through four disposal points,—Kodungalyur, Koyambedu, Nesapakkam and Pallikaranai. The drainage scheme provides for the future growth of the city and contributes, significantly to the fertiliser supply of the neighbouring areas. Another scheme which is now near completion is the Cooum river scheme and its sand silting which allows the Cooum to flow into the sea and keeps the river clean as a centre for recreation and tourism. The Housing Plan for the State amounting to Rs. 10 crores per annum reported in the last issue of the Bulletin has not been approved by Union government and so remains a paper proposal. Under the Union Government's programme of financing house sites to landless workers in rural areas, Tamil Nadu has received

approval for 36 projects involving 33,692 house sites at an estimated cost of Rs. 75.51 lakhs. This programme should be expended considerably in the Fifth Plan. The City's slum clearance programme has been allocated the Rs. 2.5 crores referred to in the last issue of the Bulletin and this allocation will be spent on improved water supply, sewers and drains, baths, widening and paving the lanes and street lights in the slum areas. Also the Steel allocation committee referred to in the last issue has been functioning since September contributing a little to the less delayed distribution of steel to house builders. The committee works on a priority system—certain categories of persons such as war widows, defence personnel, schools, hospitals and those who build on 1½ grounds. Though the delay in steel supply has been reduced from 16 weeks to 8 weeks, the real problem is that the housing demand for steel is about 3 times that of the supply. For instance, last year the State was allotted 1,65,273 tonnes for government and non-governmental consumption, producers and other stockyards and defectives, whereas the demand was around 6,00,000 tonnes. To alleviate this situation, the production of the mini-steel plants should also be channelled through the committee under the discipline of JPC and not be allowed to market their product at open market prices. For this the Scrap Metal Corporation should collect all scrap arising from turnings and borings within the Country and make it available at stable prices ro the mini-steel plants.

*Tourism*: Another Master Plan, long due, for the State is its Rs. 100 crores tourism programme developed by the State Tourism Development Corporation and based on a detailed district survey of its tourist potential. Already the Corporation capital works programme of Rs. 170.90 lakhs involving building tourist bungalow complexes in all district headquarters and tourist spots is underway. Hundred bed tourist bungalows are being built in Chidambaram, Hogenakkal, Courtallum and Mahabalipuram and small ones at Tuticorin, Nagapattinam, Tiruchirapalli and Madurai. The Ooty and Kanyakumari installation are being expanded. The number of tourists visiting the State is slowly expanding. It was 14,764 in January-June 1971 compared to 9,567 in the same period in 1970. The numbers should be twenty times that and that is the target to which the Corporation should work.

**National**

*Prices and Agriculture production*: The last issue of the Bulletin called attention to the July 8 wholesale price index having crossed the 200 point mark with the base year 1961-62. The June 1972 consumer price index for industrial workers stood at 201 at base 1960. Food articles have registered the sharpest rise by 18 per cent, cereals by 16.8 per cent and jowar, the poor man's food by 28 per cent. This inflationary situation has many long term and immediate causes that need to be identified and corrected. The annual report of the Reserve Bank for the year ending June 1971 points to some of the basic structural causes for the inflationary trend. Money supplies with the public—currency and bank deposits-were plentiful, while commodity output trends were limited. While food grain stocks were higher by half a million tonnes, at 8.9 million tonnes, they were not used in time to dampen prices. Again in refusing to lower procurement prices, buffer stock policy was converted into a price support policy when it ought to have been a price dampening one. And the price supports have helped the larger farmers only and have helped to shift production away from pulses and cotton. To these basic problems of food mis-management highlighted by the Reserve Bank are now added the drought condi-

tions in Bihar, Gujarat, Manipur, Orissa, Rajasthan, Tripura, Uttar Pradesh and West Bengal during June-August and the continuing condition in Andhra Pradesh, Maharashtra and Mysore. The flood damage in the Ganga and Brahmaputra has affected Assam and Orissa particularly, causing damage of Rs. 26 crores. The extent of the loss to the kharif crop cannot be estimated till the harvest but the Union government's forecast ranges from 9 million to 15 million tonnes.

The first action to be taken is to use our buffer stocks which now amount to 9.5 million tonnes to organise a massive public distribution programme, particularly to reach the poor sections of the population. The 5 point FCI release plan—release of stocks to the State governments distribution agencies, and the 1,25,000 fair price shops in the Country, discontinue sale of food grains through the open market, distribution of coarse grains through State agencies where they are consumed, release of pulses to fair price shops, and control of wheat products—should be put into effect immediately in the 54 drought affected districts in the 11 States affected. This distribution programme as the Reserve Bank report implies should have gone into effect at least 3 months ago in order to damp down prices. In addition the administrative hurdles in the way of enforcing the Essential Commodities Act (such as the prolonged consultation with other ministers by the originating Ministry of Industrial development) should be ruthlessly set aside and the States empowered and required to enforce its provisions. They include regulation of wholesale and retail private trade in food grains and curbing speculative hoarding so that a trader's stocks will be limited to 10 quintals of any grain and 25 quintals for all, declaration of stocks by purchasers and hoarders, reduction of the number of guests at any party to 25 and the even flow of supplies to the consumer at the rate of 8 kgs. per month per adult. There may have to be some import of pulses and edible oils. It will probably be the case that this distribution programme and net work will suffer from many birth pangs, but its implementation now will help the Fifth Plan in achieving its objective of the mass distribution of wage goods to the poverty sector at controlled fair prices. That programme can only be undertaken on all India basis.

The second equally urgent programme is to salvage the agricultural production front. An emergency programme is planned both for late kharif and extended Rabi crop to secure an additional 15.8 million tonnes. For this the State governments are being given 100 per cent assistance outside of States' plans. Short term credits of Rs. 20 crores for the kharif have been granted. The wheat area is being increased by 3.2 million hectares, rice by 3 million hectares and pulses by 4 million hectares. The inputs of seeds, fertilisers, pesticides and credit are being supplied for this emergency programme. In the case of fertilisers there will be increase imports over the normal 30 per cent. Irrigation facilities are being increased through better utilisation, quick energising of pumpsets and bunding of streams. It is a pity that inflation and drought should be the occasion for taking these necessary measures. The States have now the opportunity of placing agricultural production on a long term sound footing. Incresed production is the real counter to the inflationary pressure that the Country and the poverty sector face.

The other side to the serious price inflation is the fiscal mismanagement on which the Reserve Bank report touches very lightly. First government savings have been very low and government expenditures high—particularly non developmental and administrative expenditures. Last year against the budgeted Rs. 242 crores of savings, only Rs. 95 crores were realised. This year Rs. 496 crores have been budgeted as savings in government

administration. With the heavy deficits, partly the aftermath of the 14 day war, there is little hope of even last year's total being attained. The Central and State Government loans will be one means of arresting deficit spending and mopping up surplus resources in the hands of the public. Further, the expansion of branch banking to the rural areas will be one means of transferring resources from the rural sector to industrial investment. There is need for a clear and austere fiscal policy to contain inflation and it is to this that the Union Ministry of Finance and Planning Commission should now turn their attention. Second deficit financing to which attention was drawn in the last issue has been a major factor in the price rise. Last Year's deficit was Rs. 521 crores as announced recently in the Lok Sabha. Stronger fiscal and monetary disciplines should be practised this year to keep within the budgeted deficit of Rs. 252 crores.

*Exports*: The result of last year's poor export performance (2 per cent against the target of 8 per cent) discussed in the last issue of the Bulletin are still being considered by the government and the export firms. One effect is the downward revision of the current year's target of Rs. 1,761 crores which, given the general industrial stagnation and the short supply of steel, non-ferrous metal and cotton needed by the export sector, will certainly not be attained. Even traditionals like coffee, lemon grass and pepper are facing a declining trend. Rising shipping rates constitute a further bottleneck to our exports as explained in Vol. II Nos. 6 and 7 of the Bulletin. The recent increase from mid August of the freight rates on the Indo-US rates are an example of the many unilateral and arbitrary general rate increases and surcharges made by the shipping conferences during the last 3 years. India's membership in over 100 conferences has not stopped this trend, directed particularly against our non-traditional exports which make them non-competitive in the many new markets opening up. UNCTAD III has failed to deal with this situation and there is little hope that the Plenipotentiary Conference will do anything, as the affluent countries voted against the conference resolution at Santiago (See Vol. II No. 7 of the Bulletin). Under these circumstances, the Country must build up her own shipping services and increase planned investment in them so that by the end of the Fifth Plan 50 per cent of the exports (and not 40 per cent) are carried in Indian ships. Another development is the decision of the government to take over textile exports. The case for this decision is clear but the details of the takeover—the machinery, procedures etc.—have to be quickly clarified. The case for takeover is the steady decline in the physical quantum—not value—of textile exports. In 1968-69 against the export quota of 195.7 million sq. yds., 158 million sq. yds. was exported, in 1969-70 it was a 230 million sq. yds. target and 77 million sq. yds. exported, in 1970-71 the figures were 205 million sq. yds. and 112 million sq. yds. in 1971-72 the target was 207 million sq. yds. and the actual exports were 36 million sq. yds. Against these facts the textile industry's claim that in 1969, 70 and 71, it earned Rs. 105 crores, Rs. 117 crores and Rs. 109 crores and expects to earn Rs. 132 crores this year is misleading. What is now needed is to go beyond the present government's plans for canalising textile exports through the Cotton Corporation and to set up an active export promotion machinery. Canalisation is adequate for handling cotton imports which was 60 per cent last year, 70 per cent this year and will move into 100 per cent in the next few years. For exports, however, more is needed such as the search for markets, promotion and salesmanship, foreign market surveys and studies. In this connection the decision of the State Trading Corporation to use its Rs. 14 crores reserves to build export infrastructure, industrial research among export firms finance new

lines of exports which may not be initially competitive, promote joint ventures in West and South East Asia are moves in the right direction. This should also invigorate the export of the 24 items which have been taken over by the public sector. One of the programmes that should be launched and intensified is the training of export executives with linguistic and marketing skills. The proposal to permit IDBI to enter the area of export financing, extending credits directly to buyers or financial institutions abroad to finance import of our capital goods is also timely. The agreement with Sudan to expand exports on a reciprocal basis so that our export agreement which has reached its ceiling at the half year point can continue on a reciprocal basis, the export of 300 bus chassis to Sri Lanka and 25 to Bangla Desh, and the negotiations with UK and EEC for duty free import of jute, coir, textiles, sugar and tobacco within two years and not five years are part of the necessary export drive. The August exports colloquium of the Hindustan Chamber of Commerce and the Federation of Indian Export Organisation in Madras has come up with a series of recommendations to expand exports on a voluntary basis mainly through a smooth functioning of the incentives programme, research and common facility centres, regulatory export promotion councils which will bring the government and the trade together for the attainment of the common objective. In the end, the expansion of our exports depends on capacity industrial production within a competitive cost structure—and this is responsibility of both parties.

*Steel and the Joint Sector* : A recent study by the Financial Express summarises the operational efficiency of the public and private steel plants.

| *1970—71* | | *Gross Margin to Net Income* | *Value added to Net income* | *Capacity (million tonnes)* | *Production (million tonnes)* | *Percentage of utilisation of capacity* |
|---|---|---|---|---|---|---|
| Hindustan Steel | ... | 19.3 | 33.9 | | | |
| Rourkela | ... | | | 1.80 | 1.04 | 58 |
| Durgapur | ... | | | 1.60 | 0.63 | 39 |
| Bhilai | ... | | | 2.50 | 1.94 | 77 |
| Private Sector | ... | 18.1 | 39.1 | | | |
| TISCO | ... | | | 2.0 | 1.71 | 85 |
| IISCO | — | | | 1.0 | 0.63 | 63 |

The output and capacity utilisation declined in the public sector during the last 3 years, the fall in operational efficiency being due to mismanagement. The net income and the value added figures show a low level of financial performance and profitability of operations of the public sector vis a vis the private sector. But all these limits of HSC can be corrected and performance and profitability improved. As a result of the measures reported in the last issue of the Bulletin, the July performance of HSC is better than the April-June level. Mild steel production has increased in Rourkela, Durgapur and Bhilai by 22 per cent for ingots and 16 per cent for saleable steel. So too has IISCO recorded a general increase in all lines since the take over in mid July—saleable steel at 16,809 tonnes in July against 9,015 tonnes in June, pig iron at 55,051 tonnes from 49,883 tonnes and ingots at 23,790 from 23,064 tonnes. TISCO reports an even larger increase from 1,08,100 tonnes to 1,35,200 tonnes of pig iron, from 1,10,300 tonnes to 1,33,200 tonnes of ingots and 1,00,000 tonnes to 1,15,500 tonnes of saleable steel. As a result the steel priority

committee has been able to make a higher steel allocation for the period October-December. If this trend continues there could be some alleviation of the serious steel shortages faced by priority industries and consumers. Against the background of the relative performance of the public and private sector, the Tata proposal should be taken up, namely, a doubling of TISCO capacity from 2 million to 4 million tonnes, calling for an investment of Rs. 700 to 800 crores, with the government contributing half the outlay. The expansion should be a joint sector project with managerial responsibility vested in TISCO. In a memorandum to government, Mr. Tata makes a number of suggestions for reviving the joint sector concept, which has todate been dormant. (See the last two issues of the Bulletin). In fact this is the most creative and far sighted part of the memorandum. It is suggested that the Union government and a private firm should engage in joint production only when the capital cost is above Rs. 5 crores and for investment less than that the joint sector should be that between the State government and private firm. This will cut down delays and make for efficient execution as the State governments are nearer the project, being involved in power supply, labour conditions and development of backward areas. In all cases the day to day management should be left to the private enterprise part. Another interesting proposal is for the Union government to part with some of its shares from its profitable public undertaking such as Indian Oil Corporation, Shipping Corporation of India, etc. which could become part of the joint sector, thus releasing public capital resources for other large projects which are ready to be developed. This proposal should be examined on its merits. It should be modified on the principle of reciprocity—that is to say the losing public sectors should also become joint for that is where private managements' qualities are needed. Again private firms which are doing well as TISCO should be expanded as joint sectors. On this basis the joint sector can be brought to life and mode or powerful instrument for raising out of its stagnation.

*Companies take-over and General Insurance legislation:* The Bill to amend the Companies Act introduced in the August session of the Lok Sabha aims at debarring the take-over of well established firms by individuals and groups, to bring about a wide dispersal of existing share holdings among individual investors, to allow Statutory Corporations to acquire unabsorbed holdings and generally to control the action of large financial interests in the private corporate sector. To this end, companies with a paid up capital of Rs. 25 lakhs and over and their private subsidiaries will have prior governmental approval for the acquisition by a group or combine of 25 per cent of the aggregate share holding. The provisions will also apply to foreign companies in India. Rules are to be established for the declaration of dividends so that the company's capital and depreciation assets are not run down through declaring high dividends in a year of low net incomes and for government directors to have an effective voice in management where there are mismanagement problems. Thus the proposed legislation will have wide ranging effects on the management of established units, the composition of their boards of directors and the ownership of share holdings. The rules should be so devised as not lump the companies run with efficiency and integrity, with questionable ones. This is important because of the over riding priority to get industrial production moving. It should be possible to identify procedures which led ESSO, Good Year and Pandyan to declare large dividends partly out of reserves. Equally bearish selling of shares should be avoided which could bring about further slackening of our industrial production.

In this context, the ten findings of the Reserve Bank study on the functioning of 1,501 companies during the period 1965-66——1970-71 (See July issue of the RBI Bulletin)

and that of its affiliate IDBI are of interest. (a) During this period, manufacturing costs of the companies remained stationary at 55 percent of the value of the output, while the wage bill declined from 14 to 13.2 percent. (b) Savings in the sector increased, 290 large companies accounting for 71.6 per cent of the capital of all the 1,501 companies having near doubled their savings from Rs. 45 crores to Rs. 97 crores. The stagnation in this sector was certainly not due to a low rate of savings. (c) The companies did not borrow from banks to create non-current assets as against working capital, as it was believed in the pre-nationalisation days. (d) As against popular opinion, not only was there no rising tax burden on the corporate sector, there was an actual decline in their tax payments. The rate of corporate taxation was high at 55 per cent plus surtax, extra super tax, but due to many tax concessions and incentives, the effective tax rate was 47.4 per cent on profits before tax in 1965-66 and declined to 42.8 per cent in 1970-71. (e) The stagnant level of manufacturing costs referred to earlier was possible because the rising costs—and this was a period of fast rising costs—were passed on to the consumers. This is also seen in the fact that though the rate of increase of their physical production was low, the value of that output kept rising because of the rise in price of the product. (f) The profitability of the company kept rising steadily during the period. (g) Short term borrowings from banks as a proportion of their inventories declined (from 60.8 to 56.4 per cent) for large firms and increased (from 59 to 62.3 per cent) for medium companies. (h) Owned funds increased steadily during the period in excess of the gross assets created. (i) The gross fixed assets formation of the corporate sector declined during the period from the 16 per cent at 1966-67. Particularly in the engineering industries it declined to 8.2 per cent and was even lower in real terms if the rising money costs of investment are taken into account. (j) Machinery production and sales on deferred payment basis have during the period been promoted by IDBI to the extent of Rs. 135 crores. 27 producers and 1,300 buyers have used the discounting facilities of 27 banks. In 1970-71, the assistance disbursed was Rs. 29 crores and in 1971-72 Rs. 45 crores. Procedures are being streamlined in order to ensure expeditious decisions for the rediscounting facilities.

The General Insurance Nationalisation Bill recommended by the Joint Select Committee was adopted at the August session of the Lok Sabha. The problem of compensation of the Indian companies has been brought into line with that of the Foreign companies (See Vol. II No. 7 of the Bulletin). The Indian Companies will get Rs. 5 crores more—Rs. 38.23 crores rather than 33.03 crores—, they will be paid in cash and with interest on delayed payments, all payments will be made within a time limit and the insurance business of semi-governmental bodies as were those of State governments will be exempted from the Act. The formula for the compensation has been worked out taking into account all factors, including profitability and dividends. The decentralized functioning through 4 corporations of this sector has been retained and this competitive element is a welcome feature, in place of a mammoth all India undertaking. Also the decision to leave the service conditions and transfers of personnel to the corporations and not make them a government responsibility will make for effective management. Now the process of placing all capital resources in the hands of the Union government is complete. This power must be used in a democratic manner and must be made to fit into the decentralized planning techniques which are very slowly being introduced in the Country at the State and district level.

*Banks and the economy*: The poverty line for the Country was officially expressed by the Union Minister of State for Planning in a written statement in the Lok Sabha as

being drawn at Rs. 20 per capita per month at 1960-61 prices (See Dandekar and Rath's Poverty in India) and that 220 million people are now stated to be living below that line. Against that background the nationalised banks in the Southern region have been examining the role they can and should play in regard to the needed social and economic changes. The spread of branches to the rural areas and the area development programmes of the banks have been noted in the last and current issue of the Bulletin. The banks are using differential rates of interest not only between different income groups but also between different categories of small farmers. Those with less than 3 acres are charged 8½ per cent, between 3 and 5 acres 9½ per cent and those above 5 acres 10½ per cent. The next stage is for the banks in this region with their high deposit—advance ratio to finance rural electrification and development of ground water resources of the backward and drought prone areas. Another area where banks will be called upon to play a key role is development and financing of the package plans for backward areas. These areas cannot become developed simply by locating industries there, as we see in parts of Chingleput or Salem or Dharmapuri. What is needed is a package of agricultural development, agro industries, trade and industries and it is to identifying this all round techno-economic development of the backward districts (which have now been increased from 2 to 6 for each State for the receipt of industrial subsidy) that banks must now lend a hand. Another promising programme is the programme of 5,000 Jayanti villages, one in each Block with 100 houses for Harijans, additional provisions for buildings for the primary school, drinking water, public latrines, like roads and electrification. This again must be carefully planned and economically financed with the help of the banks so that they are pilot projects which can spread to all blocks and villages and not become white elephants.

*Sugar Policy*: The long awaited Sugar Policy was announced in the August session of the Lok Sabha. In place of the current cane price of Rs. 7.37 per quintal linked to a recovery of 9.4 per cent, with the percentage of levy sugar at 63.5 and different prices for different zones, the new policy for the 1972-73 season is: (a) the minimum price of sugarcane of Rs. 8 per quintal linked to a recovery of 8.5 per cent: (b) a premium of 9.4 paise for every 0.1 per cent increase in recovery: (c) continuation of statutory partial control under which the percentage of levy sugar will be 70 and free sugar 30: (d) the issue price of levy sugar will be the same throughout the Country: (e) the proposal of a small extra central cess for R and D aimed at increasing the sucrose content in sugarcane. The primary effect of this policy will be to expand sugarcane cultivation for the next season. Cane growers will be receiving Rs. 15 more per quintal. As a result, levy sugar price may go up by Rs. 15 per bag and free sugar price may increase considerably more due to the reduced percentage allotted to it. The increased percentage of levy sugar will meet both the internal demand of lower income groups and the export obligations of the Country. There is general agreement with the announced policy on the part of the public and sugar producers—particularly in South India and Maharashtra. With the uniform viable cane prices, the producers will now be on their mettle in using capacity and ensuring performance. Tamil Nadu in particular welcomes the price and recovery rates and uniformity in levy prices as making for increased production and equitable distribution. The R and D proposal must be turned into a programme in order to raise the quality of sugar production in the Country.

*Aid:* Japan has agreed to rescheduling of our debts during the current fiscal year in the amount of $43.43 million and the period of rescheduling is for 25 years. This

agreement represents avery considerable liberalisation of repayment terms, as during the past 30 years the rescheduling amounted to $20 million and the period 11 years. Other creditor countries have similarly agreed to the rescheduling formula proposed by the World Bank and have concluded agreements to that effect with India (See Vol. II Nos. 8 and 9 of the Bulletin). As a result there will probably be no special meeting of the Aid India consortium to discuss and agree on rescheduling. India's negotiations with EEC for the setting up of a joint commission to negotiate a comprehensive trade agreement are related to its aid position. Such an agreement can help the Country to develop a substantial trade surplus with the enlarged Community not only to compensate for past and present trade deficits and permit a renewed expansion of the Community exports but also to facilitate the repayment of debts.

*Bangla Desh :* The Indo-Bangla Desh power board formed in July is executing the integrated power development projects for the two countries and advises on and formulates proposals for coordinating power development of the two countries. This will in the long run be aid from Bangla Desh to West Bengal. Another area where Bangla Desh is aiding India is in the provision of 2 lakh tonnes of furnace oil by March 1973. By early August 8,222 tonnes had been delivered and now the supply should be stepped up. Jute is a further area of Bangla Desh aid to India. The August harvest of the jute crop in Bangla Desh is between 6 to 6½ million bales and the condition and quality of the fibre are good. Apart from jute exports to France, Japan, Poland, Russia, Belgium, UK, Germany and Spain, the jute industry which is doing well, will be in full production before the end of the year. Already it has been able to promise importers 4,00,000 tonnes which is the current Indian shortfall. Fish exports to India have also begun as part of Rs. 9 crores export agreement between the two countries. On India's side the agreement to provide 7 lakh tonnes of coal valued at Rs. 4.5 crores has got underway with the export of 60,000 tonnes of steam coal by the end of August by the Minerals and Metals Trading Corporation. Negotiations are underway for the supply of spare parts for jute, tea, and textile industries in Bangla Desh. The Shipping Corporation of India has agreed to provide Bangla Desh with ships on single voyage/line charter basis for its exports to UK, Europe, Australia, US, West Asia and Africa. And despite the drought, India has agreed to supply an additional 2,00,000 tonnes of food grains, (the first 50,000 tonnes being delivered as reported in the last issue) to meet the food scarcity in that country. Bangla Desh needs aid in building materials and cloth and this must be made available in the interest of helping it to restore normal conditions as rapidly as possible.

**International :**

*Non-aligned Conference :* The George Town, Guyana Conference of Non-aligned foreign ministers represents a further stage in developing and extending economic cooperation among the non-aligned countries. Practical bilateral and regional agreements to expand and promote trade among them, to develop joint enterprises, to exchange technical know how will be one outcome of the conference. The decision with regard to the member developing self reliance and monetary and mutual assistance must be translated into programmes in face of the setbacks of International cooperation from the developing countries that UNCTAD III represents. The conference's decision with regard to nationalisation of foreign monopolies needs to be translated into corporate and fiscal terms to ensure no break in the growth and development of the countries. The

George Town Declaration which runs into several pages must be turned into programmes. Too much of the Lusaka conference resolutions have remained as hopes and aspirations without follow up. Even among the originators of this movement, namely, India, UAR and Yugoslavia, trade and mutual economie cooperation has not only not expanded, there has been some falling back. It is a matter of regret also that the conference decisions were not arrived at by unanimity. It is hoped that between George Town and the meeting in Algeria of the heads of governments of non-aligned countries, both practical action to give content to the declaration and resolutions and a restoration of unanimity particularly on matters relating to South East Asia will be achieved.

*International Monetary Reform :* There is general agreement on the urgency and need for international monetary reform but it looks as if the process of discussion, negotiation, bargaining will take us into the end of 1973 before an agreement is reached. The European Finance Ministers' indecisive meeting on monetary reform was referred to in the last issue of the Bulletin. The major issues continue to be : (a) Gold price. The IMF has now officially proposed considering an increase in the price of gold to bring it nearer the free market price of $70 an ounce, in addition to the alternative of letting the free market price continue and immobilising the stocks of gold in the reserves of the countries. The third alternative of trying to force the free market price down through sale of gold stocks is unrealistic as there is not enough gold to achieve that : (b) There is the problem of floating currencies of UK and allied countries. Here the UK has promised to return to a fixed parity by January 1, basing itself on the London agreement on fixed but adjustable parities : (c) There is the problem of hot money—the enormous pool of Euro-dollars which again can be decided internationally through a funding by SDRs which is the only practicable course as suggested in the last issue of the Bulletin. The other alternative is for the US to repatriate the pool by the offer of high interest rates : (d) There is the convertibility of the dollar into gold ardently desired by European governments and bankers. The US government in August sold some of its gold reserves to stabilise the free market. But there is little hope of US return to gold convertibility till there is equilibrium in its payments balance : (e) There is the SDR problem and the most urgent is the need for all to agree on a further reissue at the IMF meeting in September, as the first issue expired at the end of last year. Then the link between SDRs and development assistance must be faced. The IMF meeting should be the occasion for an agreement in principle on the main issues—fixed parities, SDRs reissue and their link to development aid. Any system of floating parities or its expression in the two tier system will restrict world trade, development and the well being of developing countries.

*IBRD reorganisation :* The International Bank for Reconstruction and development is reorganising its structure both to increase the speed of decision making and improve quality of its work. Its operations have expanded very much and include sectors not usually in a banks' purview such as population, tourism and urbanism. The bank's work is to be decentralized in five Regional offices for (a) Latin America and the Caribbean (b) East Africa (c) Europe, Middle East and North Africa (d) West Asia and (e) Asia. Each Regional office headed by a regional vice-president will, within approved policy, be responsible for planning and executing the bank's lending and technical assistance programmes in individual member countries. This reorganisation, with which other UN agencies might well follow, will enable the bank to integrate its area and project activities and ensure that the development of individual countries is the basis on which bank's programme rests.

*Asian Reserve Bank :* The Asian Reserve Bank will be established on the basis of each Asian country being required to keep 10 per cent of its official international reserves on deposit with the Bank. The Bank will (a) help ease any temporary payments problems resulting from trade liberalisation (b) contribute to the growth of regional markets (c) help in the transition to a decline in foreign aid and military expenditures (d) provide an additional source of payment credit for countries who have temporary problems. Funds would be available for loans to members and to invest in regionally issued securities. Given the uncertain monetary situation referred to earlier the Asian Reserve Bank can strengthen the fiscal and financial position of Asian countries and cushion the losses they suffer from sudden revaluations, devaluations and floating of exchanges by the affluent countries.

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**Agricultural Development**

*Paddy and Food production :* Last year represented an important move forward in paddy production in the State and according to the Union Agricultural Ministry team which has visited and inspected the State programme, 80 per cent of the area has increased production to 53.62 lakh tonnes as reported in Vol. I Nos. 10 and 11 of the Bulletin. The team recommends that seed distribution in the State be turned over from the Department of agriculture to seed producing agencies, cooperatives and private seed trade bodies. For the current season the delayed monsoon has led to delayed planting and transplanting of paddy in the Tambaraparani basin, the Chittar basin, and the Gadana and Ramanadhi rivers. In the Sholavandan area there is need for more rains in the catchment of the Periyar project to ensure a successful paddy harvest. In some areas the members of the Board of Revenue report drought conditions as in parts of Dharmapuri and North Arcot. Failure of rain in the catchment area and the fast depleting level of water in the Mettur reservoir as at early September (the daily drawals are 28,000 cusecs and inflow 12,000 cusecs), has led to the introduction of the turn system for the supply of irrigation water through the various rivers in Thanjavur delta from September 3. A high turn in the Cauvery is followed by a similar turn in the Vennar for the next three and a half days. During the operation of this system water is available at the rate of 2.000 cusecs. Nearly 12 lakh acres out of the 14.5 lakh acres of net crop land are irrigated in Thanjavur district for one season through an intricate net work of 1,600 miles of canals. The district did not have rains for over 3 months this year. Thus the prospects of the paddy crop are somewhat precarious as at September of this year. The most popular variety in the State is IR 8. It is a heavy yielder at moderate cost but where two savings are possible. Its duration however makes difficult the advantages from multiple savings. The Tirunelveli delta and Kanyakumari districts are areas where short duration varieties like ASD-1 have been in use primarily because they yield in 3 months. Recently the Pennai variety of paddy which is a cross between Taichang Native 1 and ASD-1 has come into extensive use in this area as the first sowing, with IR 8 as the second crop. Pennai paddy has a finer grain than ASD-1, has a better quality straw and commands a better price. It is now sown over 10,000 acres and will soon spread all over the delta area. Another paddy strain coming into use is the salt resistant varieties C-1327, MCM-1, MM-2, TN-1 which can be grown in the saline soils of the coastal regions of the State. They have a high salt tolerance, are of short duration

and good yielders. For this reason, the government has planned to purchase half a lakh tonnes of Kuruvai paddy from the Thanjavur district following last year's purchasing procedures (See Vol. II No. 4 of the Bulletin), except that as from September 13 the 25 per cent procurement levy on stocks of paddy and rice moved out of Thanjavur district has been withdrawn with a view to prevent a steep fall in local paddy prices. On the other hand the quantum of levy in Kanyakumari district and Uthampalayam and Periakulam taluks in Madurai district has been raised from 15 to 25 per cent. In Ambasamadrum, Shencottah and Tenkasi taluks of Tirunelveli district the levy remains at 15 per cent. The main objective of this programme is to prevent distress sales by the farmers and also to add to the buffer stocks in view of the general shortfall in food grains production facing the Country. The FCI and 70 civil supplies hauling agents will be the main purchasing agents. A further infrastructural aid to the State's food production is the Cauvery Command Area Marketing Complex. Costing Rs. 150 lakhs, the Complex is developing six marketing centres with feeder roads from Thanjavur, Tiruchirapalli and South Arcot. In addition to the grain storage godowns constructed last year, Rs. 30 lakhs is being spent this year in the construction of godowns at Pattukottai, Tirutturaipoondi, Courtalam, Kattumannar Koil and Thanjavur in Thanjavur district, and Manachanallur in Tiruchirapalli district. An additional Rs. 30 lakhs is being spent on constructing feeder roads linking the marketing centres, godowns and villages apart from the Rs. 6 crores rural roads programme described in Vol. II No. 8 of the Bulletin.

*Other Crops*: The Union government team has endorsed the State programme introducing the short duration cotton variety (PRS-72) in the rice fallows of Thanjavur (See Vol. II No. 7 of the Bulletin). The government plans to extend this cotton cultivation programme to an additional 64,000 hectares in Thanjavur, Tiruchirapalli and Madurai. In addition to adding to our cotton supply, it provides a commercial crop income with farmers in those areas during the 3-4 months of no crop. For the Country as a whole, a record cotton crop is expected for 1971-72 at well above the 1964-65 record of 56.8 lakh bales. Against the export target of 2.75 lakh bales for this year, by June 2.30 lakh bales had been registered and 1.65 lakh bales exported. For this year there is a problem in this State. The Tirunelveli 50,000 acres successful Intensive Cotton Development Programme (ICDP) has had a serious marketing aftermath. Those who participated in the programme gained a near three fold increase in their cotton production (234 kg per hectare against the normal 97 kg) but they are now left with 1 lakh quintals of cotton unsold. There is no market for the growers in Kovilpatti area. The Cotton Corporation set the price of cotton at Rs. 200 per quintal, the ruling price is Rs. 140, the Corporation began buying the cotton at Rs. 180, but with its discontinuance, the ICDP producers facing a serious problem of loss. They see that the farmers who stayed out of this programme and did not incur the additional expenses, are able to dispose of their small stock. The effect that this will have on this year's cotton growing is a serious problem. It is urgent that the ICDP should develop a marketing wing with sufficient authority and resources to buy the cotton after the harvest. In fact as 70 per cent of the whole cotton area is under desi cotton, there is a case for a separate agency or wing of the Corporation to be set up to deal with this large body of small dry farmers and provide them not only with the needed inputs but also the marketing facilities. This is as important, if not more, as the Small Farmers Development Agency (SFDA) which is still being run in this State on a pilot

project basis in Madurai. SFDA financing (Rs. 10 crores for all India) covers land shaping, land reclamation, horticulture, agricultural harvesting, dairying as well as marketing stores, tractor services and fertiliser distribution.

The Union government has announced its decision to the effect that the fertilisers produced by the Neyveli Lignite Corporation and Hindustan Steel Limited, will in the future not be distributed to the farmers through private trade channels. At present Neyveli distributes 40 per cent of its urea production through Rallia India and the rest through the government departments. The decision not to use private trade channels but only cooperatives and public sector channels goes back on the urgent need to ensure speedy and effective distribution. (See Vol. I Nos. 6, 10 and 11 of the Bulletin). Already farmers in Thanjavur district are complaining of bottlenecks in governmental distribution. The State government should examine this question and advise the Union government on what will ensure effective and equitable distribution. Another State programme which has commanded support is the research, adaptive research, demonstrations and intensive cultivation of pulses at a cost of Rs. 45 lakhs per year. The State is most deficient in this food crop and the Union team's recommendation to the ICAR to set up a Pulses Research Centre in this State for which the government has offered 100 acres should be speedily acted upon. In the area of sunflower and castor seeds, there have been further important developments. Sunflower can be grown in the hills in this State as demonstrated in its cultivation as an inter crop in coffee estates at an altitude of 4,000 feet. In the Pullavalli estates its yield has been 400 kg per acre. It yields in 88 days, involves no pests and grows in rain fed conditions. It is now spreading fast to Kodaikanal at nearly double the height (7,000 feet) and Yercaud. Further four new castor strains which are a heavier yielding strain than Aruna with larger size have now been developed and will soon begin to be grown. To protect the groundnut crop, the Department is launching an integrated plant protection campaign for large scale ground spraying to eradicate the redhaired caterpillar. Costing Rs. 7.50 per acre which is three fourths the cost of aerial spraying, it will also educate the farmer who can watch, learn and control the spraying. It will also generate employment locally. For every campaign 3,000 to 4,000 workers will be employed for 10 to 15 days, after which they become skilled sprayers who can go into business on their own with loan assistance from banks.

*Tea and Coffee*: The South India tea crop figures for the first six months of this year shows a decline of 5 million kgs compared to January-July 1971 (53.2 million kgs compared to 58.6 million kgs). North Indian tea production, however, increased to a point so that the Indian tea production for the period January-July 1972 increased by 12.79 million kgs to 80.45 million kgs. Export prices have been declining and there is need for tea producers to help counter this trend. Tamil Nadu has the higher per hectare tea yield at 1,614 kg. compared to 1,221 kg All India and 1,032 kg in East Africa. In this State there are 10 cooperative tea factories, nine of which are functioning efficiently and the tenth getting underway. The government has decided to set up a few more cooperative tea factories with financial assistance from the Union government. These factories are of particular service to small plantation owners and help in processing and marketing. The coffee crop for 1971-72 as reported in the last two issues of the Bulletin was 69,000 plus a large carry over from the 1970-71 season. The export from that season again reached a new height of 47,655 tonnes and from the 1971-72 crop 40,000 tonnes will be exported and 39,000 tonnes sold in the domestic market this year. If, as reported in the

last issue, the crop for 1972-73 is 87,000 tonnes, with the carry over from the last production season, there will be a coffee availability of 1,00,000 tonnes next year. Exports cannot be further expanded and with the increase in internal prices, and the decreased purchasing power in the rural areas due to drought conditions. there is likely to emerge a large volume of unsold stocks. The Coffee Board must now plan to deal with these conditions of relative glut. The plantation economy is in good shape and its performance should be conserved. Using 0.6 percent of the cultivated land, it contributes 4 per cent of the total agricultural production and around 15 per cent of the Country's export earnings.

*Fish and Dairy Farming*: The State is moving into a more effective programme of fish farming which is being referred to as the coming Blue Revolution in Tamil Nadu—analysed in the last 3 issues of the Bulletin. The two 57 foot trawlers referred to in Vol II No. 8 of the Bulletin are now engaged in the off shore survey of the availability and precise location of marine fish in the different deep sea areas of the State. The FAO fisheries survey computed that there were 9 million tonnes of fish available for exploitation, of which only 2.5 million tonnes were being exploited. Hence the State is acquiring two more mechanised fishing trawlers so that by the end of 1973 the four boats can complete the survey of the whole Tamil Nadu coast in blocks of 25 square miles. In addition the current 600 mechanised 32 foot fishing boat fleet is being expanded to 1,000 by the end of the Fourth Plan together with small boats with outboard motors to supplement the 4-5 mile coverage of our fish resources by our 30,000 catamarans. A gap to be filled is the acquisition of sea going vessels which can be used for tuna fishing to be found 800 miles off the coast. Work on the fishing harbours in Royapuram, Ennore, Muttom and Vallinokkam to provide berthing space for mechanised boats are underway. In land fishing is in much better shape. The State produces 1.2 lakh tonnes of inland fish annually, being second only to West Bengal. All major reservoirs—Mettur, Bhavanisagar, Amravati have a successful programme of controlled stocking and multiplication of quick growing varieties of fish. The State's Fifth Plan programme to combat protein deficiency will be considerably helped by its Fishery Programme.

In dairy farming a strong recommendation has been addressed by the Union Agricultural Ministry team to the State government to step up its outlay both on animal husbandry and dairy farming in the current Plan period. The first three years expenditures on animal husbandry are Rs. 54.16 lakhs which are only 13.5 per cent instead of 60 per cent of the Plan provision. For the current year Rs. 112.07 lakhs were recommended but only Rs. 62.25 lakhs provided. Similarly the first year's expenditure on dairy development was only 32 per cent (Rs. 144.59 lakhs) of the Plan provision. Both outlays must be now increased. The State government has drafted a plan for cattle insurance and forwarded it to the Union government a part of a Country-wide plan to improve the quality of our cattle. Further to State plans for increasing milk supply and distribution discussed in Vol. II Nos. 7 and 8 of the Bulletin, the Union Ministry team underlines the importance of installing another bottling plant with a capacity of 12,000 bottles per hour in the Madras Dairy project in view of the inadequacy and obsolescence of the existing plant vis a vis the growing demand in the city. It also recommends setting up a condensing unit in the Madurai Dairy project so that the surplus milk in that area instead of being transported as at present in liquid form by road can be condensed into milk powder and sent to Madras. This is a Plan project which has not been implemented and should be. Further the procurement and distribution of milk by the dairy plants at

Thanjavur, Chidambaram and Tiruchirapalli should be considerably expanded and strengthened as they are at present using only 40 per cent of their installed capacity. Also the funds generated at the Madras and Madurai dairies should be expended more speedily. At present only Rs. 2.75 lakhs have been spent against the accumulated sum of Rs. 25.6 lakhs. Another important recommendation is to improve the efficiency of the Madurai dairy which was set up with Rs. 28.8 lakhs of Unicef equipment to supply subsidised milk to pre-school children and pregnant and lactating mothers up to Rs. 42 lakhs by 1977-78. So far the dairy has provided only Rs. 2.67 lakhs of such subsidised milk and it has a little over 4 years to catch upon its modest but as yet undischarged commitments.

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**Industrial Development** :

*Salem Steel :* As suggested in Vol. II Nos. 7 and 8 of the Bulletin, the Union government has decided to invite the West German firm of Wilten AG to supply the technology for the manufacture of special steel at Salem. The Sarin team recommended the German firm among the various competitors because of its prior experience in supplying Japan with the similar process and because the LD process technology developed by the firm reduces production costs. The German firm will conform to the usual procedures regarding appointment and payment of personnel and the association and training of Indian technical firms. The quite unnecessary controversy raised by Durgapur that it be given the responsibility for producing the 75,000 tonnes of stainless steel for which Salem will be responsible should now end. The first thing that should be attained in Durgapur is to produce somewhere near its existing capacity. In stainless it has a capacity of 13,000 tonnes and produced only a little over 50 per cent last year (7,000 tonnes). Against an ingots production capacity of 1,00,000 tonnes, it produced only 56,000 tonnes last year. Despite this poor performance, the government has decided to increase the latter capacity from 1,00,000 tonnes to 3,00,000 tonnes. Its alloy steel plant built with Japanese and Canadian collaboration at a cost of Rs. 63 crores has resulted in a loss over the last five years of 30 crores. The first task of Durgapur and the West Bengal government is to ensure the capacity production of this HSC unit. Stainless steel is a lucrative product but our experience to date is that we manage in Durgapur to turn such an enterprise into a non-paying losing unit. Salem can learn from the experiences of the three HSC units. It will start with ore imported from other States and later take on the Kanjamalai ore. Similarly it will use HSC coke to start with rather than that from Neyveli. The major criteria for its functioning from the beginning should be that is must be a profitable operation.

*Boiler Plant :* Vol. II No. 4 of the Bulletin analysed the first phase expansion of the High Pressure Boiler Plant at Tiruchirapalli. This phase now underway will increase the boiler capacity from 750 MW to 1,100 MW and involves the installation of some sophisticated machinery to meet the changing pattern and design of the boilers. It has reached such a level of technical efficiency that not only it is internationally competitive, having been awarded contracts for boiler supply by Singapore, it is regarded by Japan, the foremost producer in this field as the most efficient producing unit in the world. This first phase is being completed in 1974-75. Now the Plant is planning its second phase

expansion to further upgrade its design and manufacture technology and to increase its capacity to 2,500 MW at a cost of Rs. 12 crores. As noted in earlier issues, this plant is a model sector undertaking in its planning, management and designing. It is able not only to provide fully for depreciation but for the normal returns and the resources for its expansion. As the major input for our power programme and schemes—hydel, thermal and atomic—it has a record of prompt and efficient delivery. As pointed out in Vol. II No. 8 of the Bulletin, the bottlenecks, delays and shortages in our power schemes are largely due to the Electricity Boards and other agencies involved in the power schemes. For instance the Fertiliser Corporation has placed an order for 12 industrial boilers at a cost of Rs. 36 crores and these boilers will be delivered in time. On the other hand one State Electricity Board which has received 80 per cent of the components of the Boiler that it has ordered has done nothing for 6 months to have them erected. Another Board which has received and commissioned 2 boilers valued at Rs. 10 crores has so far not reimbursed the Plant. It is necessary that the procedures for advance and down payments by the Boards be established and adhered to.

*Madras Refinery :* With the completion of the first phase of the oil jetty in the Madras harbour (See Vol. II Nos. 3 and 4 of the Bulletin) and the facilities for receiving tanker upto 42 feet draft and with further deepening of the approach channel and turning basin to provide a draft of 46 feet at the jetty berths by January 1973, the programme for increasing the throughput of the Manali refinery from the present 2.5 million tonnes to about 2.8 million tonnes at a cost of Rs. 20 lakhs should be completed by the end of the year and proceed to the next phase of expanding capacity to 3.2 million tonnes. The plant's throughput is steadily increasing from 2.1 million tonnes in 1970-71 to 2.47 million tonnes in 1971-72 and to 2.8 million tonnes for this year. The lube plant has also been increasing its production from 20,000 tonnes per month in April-June, to 21,600 tonnes in July. The plant is well on the way to becoming a highly profitable and effective undertaking.

*Textile Mills* : Further to the agreement negotiated by Chief Minister in the textile labour dispute (See Vol. II No. 4), the Tamil Nadu Textile Corporation (TNTC) is taking over the last four sick mills—Pankaja, Kalleswara and Sharada in Coimbatore and Balaramavarma in Shencottah. The seven others taken over in 1970 and 1971—Ranga Vilas, Om Parasakthi, Krishnaveni, Murugan, Cambodia, Somasundara, and Coimbatore Spinning and Weaving—are being modernised at a cost of Rs. 2 crores, out of which Rs. 90 lakhs have been spent to date. The new machinery installed has improved working conditions and the product. Better yarn selling at higher prices at which the best yarn is sold in the Country has enabled the mills to make a net profit of Rs. 2.6 lakhs in 1971-72. Of the four remaining sick mills, the enquiry into the Pankaja has been completed and the High Court has been moved to approve the take over. Kalleswara is in the same situation, except that its owner has got a stay order from the Court. Sharada and Balarama Verma have been examined and the TNTC action on the report will be taken by the end of the year. The Corporation in addition to its take over and controller responsibility, also supervises the functioning of mills which have taken government loans, of which there are seven.

*Harbour and suburban Railway*: Further to the improved tanker receiving capacity of the fishing harbour, the Madras harbour expansion programme analysed in Vol. II

Nos. 3 and 4 of the Bulletin is developing speedily to provide facilities both to the Madras industrial hinterland and also serve as a service centre for the three Southern States. By 1974 to accommodate ore carriers of deep draft, a fully mechanised ore berth with all the facilities for receiving by rail, stock piling, reclaiming, weighing, sampling and ship loading will be ready. This will enable the port to increase its ore handling from the present 2 million tonnes to 5 million and later to 8 million tonnes. The trade handled at the part is around 7 million tonnes a year now (from 1.7 million tonnes in 1947-48) and the trade pattern and cargo reflects the growing industries, Manali, Madras Fertilisers etc. in the hinterland. The quays and jetties have been modernised with 51 electric cranes with a capacity of 3 to 60 tonnes, a floating crane of 120 tonnes, along with palletisation of cargo and a round the clock shipping control service. With these facilities, the port will be handling 10 million tonnes of cargo at the start of the Fifth Plan. In the Plan, there will have to be further expansion to keep pace with the industrial and trade developments. The suburban railway services between the Madras harbour and the industrial area of Guindy, Chingleput, Kancheepuram, Tiruvellore, Vandalur, Guduvancheri are being strengthened. Train services every 3 minutes for an additional 2,000 persons per train have been provided on the Harbour-Beach line and similar services in the other lines. Travel infrastructure is now catching up with the growth of city.

*Minerals and Energy*: The first phase of the Minerals survey of Tamil Nadu with the help of the United Nations covering 6,000 square miles over a period of 2½ years is now over. The department of Atomic Energy is examining the economic viability of the uranium and thorium deposits in Tirupattur. The Government has started pilot mining of vermiculite in order to test the quality of the ore for insulation material. The 140 million tonnes of Salem type iron ore discovered near Tiruvannamalai are being sampled and tested in many laboratories the world over to determine its quality and method of processing. Now the second phase of the minerals survey has started over an area of 5,000 square miles with the help of aircraft equipped with electro-magnetic survey equipment. Special attention is being paid to areas like Mamandur where multi-metal ore deposits (copper, lead, etc.) occur. The August Seminar in Madras on energy economics has raised the question of what is the cheapest and most effective form of energy for the State and the Country. There is no single simple answer. One negative conclusion is that the present heavy relicence on oil should be decreased both because it is an imported raw material and is a heavy drain on our foreign exchange. Thermal power is within reach of every part of the Country, only if we can be assured of a sound wagon managent. The lack of cement which has brought to a halt the two multi-crore UP projects-Yamuna hydel and Ramganga-because of the non-arrival of cement, which cement is being stocked up here in Tamil Nadu is a pointer to the railway wagons bottleneck. Hydel energy is also effective and cheap but there are vast areas where the hydel resources are absent or negligible. Atomic energy is the wave of the future. By 1978-79, we will be using 11.4 billion kilowatt, in place of the current 2.4 billion kilowatt. Only it requires a high load factor—Tarapore has an 85 per cent load factor and Kalpakkam which unfortunately will be delayed by one year and not become critical until 1975, will have a 75-80 per cent load factor. It is our multi-based electric power resources that we should strengthen in the Fifth Plan.

*Handlooms:* Accumulated handloom stocks as at August are of the order of Rs. 8 crores. This is a doubling of unsold stocks at Rs. 4 crores in May noted in Vol. II

No. 6 of the Bulletin. The causes for this grave and worsening situations are those set forth in that issue. The decline in exports, the high price of yarn, the unhealthy competition from the mills, the breakdown of the voluntary pool scheme, the loopholes in the reservation which other States take advantage of—are still the causes. The government on its side has acted on many of the remedial measures suggested in the analysis of the problem in Vol. II No. 6 of the Bulletin. It has increased the supply of yarn to weavers' cooperatives by selling 50 per cent of the yarn of the cooperative spinning mills at a 1 to 2 per cent lower price than the open market. On fine counts, the price is 10 per cent lower. It has made representations to the Union government to close the loopholes in the existing system of reservation, by suggesting reserving certain varieties exclusively for the handloom sector. It has taken action with the Reserve Bank to liberalise its production and sales norms on the strength of the State government guarantee and the assurance of the apex society to lift the goods fully so that the bank can finance fully the primary societies' needs. It participates in the share capital of primary weavers cooperatives to improve their borrowing base. It has given 100 per cent loans for individual weavers to become members of the cooperatives. It runs new training programmes in 12 centres as suggested in Vol. II No. 6 of the Bulletin. All this involves a Fourth Plan outlay of Rs. 10 crores and handloom expenditure of Rs. 2 crores during the first 3 years of the Plan. In addition the government is planning a special drive during Deepavali to help sell Rs. 2 crores of handlooms. The problem of accumulated stocks remains and has reached grave proportion. The government is now studying the possibility of supplying entirely the weavers' cooperatives yarn demand at fair prices from the production of the cooperative spinning mills and the mills taken over by TNTC. The problem however needs to be studied in depth and long range measures on the demand and supply side need to be devised and executed. The three man committee now appointed to review and propose within two months, a development programme for the State handlooms will ensure that objective.

TIDCO. The Tamil Nadu Industrial Development Corporation (TIDCO) is responding to the Union government's concern concerning the slow rate of execution of letters of intent granted to the States. As analysed in Vol. II Nos. 4, 5 and 6 of the Bulletin, TIDCO has received 17 letters of intent and has launched projects in the case of 3—the Alangulam Cement Plant, Concast at Arkonam and SPIC in Tuticorin. It should now start immediately to execute the projects not requiring foreign exchange. The Rs. 75 lakhs Southern Borax Ltd. to be located at Minjur in Chingleput district to produce 15,000 tonnes of borax and 3,000 tonnes or boric acid should now get under way. Similarly the Rs. 75 lakh Tamil Nadu Chromates and Chemicals Ltd. in the Madras area to produce 6,400 tonnes of BCT powder per annum should now be executed. Negotiations with Mitsubishi of Japan should be speedily concluded to get under way the Rs. 3 crore Tamil Nadu Chemicals Products Ltd. at Karaikudi to produce 3,300 tonnes of sodium hydro sulphate per annum. Similarly the Rs. 10 crores Tuticorin Alkali Chemicals Ltd. to manufacture 66,000 tonnes of soda ash and ammonium chloride in collaboration with SPIC and Japan should be speeded. Another letter of intent awaiting execution is the Rs. 1 crore Melur project to produce annually 1,800 tonnes of potassium chlorate with West German collaboration. For the last two years of the Fourth Plan, TIDCO policy should swerve in the direction of executing the 14 approved projects and processing the 13 applications for the Fifth Plan.

*Small Industries*: As reported in Vol. II No. 6 of the Bulletin, the Tamil Nadu Small Industries Development Corporation (SIDCO) is setting up a multi purpose industrial estate at Kuruchi adjacent to the private industrial estate, with most of the 50 industrial units serving as ancillaries to the area's textile industry. In addition to the electronics estate in Madras (See Vol. II No. 6 of the Bulletin), SIDCO is developing a chemical complex in the Coimbatore-Mettupalayam area to use local raw materials. The Mettur region offers materials for the chemical complex and branches in Sivaganga and Dharmapuri will open up these industrially backward blocks. SIDCO is also setting up 50 new industrial units in Ambattur estate to act as ancillaries to T. I. Cycle group. In Madurai a 10 acre artisan unit is being set up at a cost of Rs. 10,000 to train and provide facilities for local artisans. In addition to TIDCO's plan reported in Vol. II No. 6 of the Bulletin, in the Adyar Electronic industrial estate, 4 small units will join together in producing 2,500 TV sets under a common brand name. This unit will help the electronic units in the estate. The Electronics Commission is very anxious that these sets should be on the market next year to meet Bombay's growing demand as its TV opens on October 2, followed by Kanpur, Amritsar, Madras, Srinagar and Calcutta before the end of the Fourth Plan. TIDCO's factory may take sometime to get organised. These four small units should start production by the end of the year.

*CLRI*: The close relations between the Central Leather Research Institute (CLRI) and the leather industry is a model for our national research laboratories as indicated in Vol. I No. 9 and Vol. II No. 3 of the Bulletin. CLRI working with the industry has released four new processes and is working on a fifth which will help leather exports and expand the domestic demand. The first process makes chrome leather resistant to heat at very high temperatures so that it can be easily screen printed, block printed or dyed by tie and dye techniques through steam heating for giving rich, bright and fast shades demanded by our export markets. The second process enables dry chrome leather to be easily wetted, so that it need not be exported as at present in the wet blue condition with accompanying heavy transport costs. The third process is a vegetable tanning material from man grove extract which is going into production by a Calcutta firm. A fourth process is for extracting tanning from tamarind seed husk and for kutch extract. The fifth process is the production of nutritious protein food from our slaughter house bye products as well their use in cosmetic and pharmaceutical industries. Work on this process is still at the laboratory stage.

*Private Sector*: Southern Industrial Corporation, with the support of the State government has applied to the Union government for a license to establish a Rs. 40 lakh plant to manufacture 10,000 power tillers a year. The tiller (175 cc) will meet the needs of the small farmers for ploughing, rotary cultivation, pudding, weed eradication, ridging etc. It will be priced at Rs. 4,000 and can be used by small farmers' cooperatives, SFADs, MFALs, etc. Its repair and maintainance can be undertaken by the farmers and the servicing and major repairs by agro-service centres or local mechanics. Madras Modern Builders, refashioned from Madras Builders, with an authorised capital of Rs. 50 lakhs has raised 12.75 lakhs in equity shares to build immediately 150 houses for sale at Adyar. It plans to engage in building 500—1,000 units per annum for low income groups. Carborandum Universal has received Union government clearance for setting up the first Rs. 1 crore unit for production of 3,000 tonnes of electrocast fusalcast refractories per annum. It will use imported machinery for Rs. 7.5 lakhs and will be saving the Country

annually Rs. 1.5 crores on imports. The annual report of the Lakshmi Mills which has 1,57,000 spindles and 394 looms including 260 automatic ones records a production of below Rs. 14 crores and a fall in profits. It has maintained its exports to the UK, supplied 200 million square metres of coarse cloth to the poor consumer and participated in the yarn pool scheme to supply the Weavers' Cooperative yarn at subsidised rate. Its modernisation programme has proceeded apace with renovation of machinery at both the Coimbatore and Kovilpatti units, in the khadi dyeing plant and the hank yarn drying machine. The weaving department has been automoted. The mill worked below capacity because of the shortage in stable fibre and imported cotton and has faced the problem of rising cotton prices, inflation induced increased dearness allowances and two periods of strikes. On the whole the year has been a poor one for the unit. The Mayavaram Financial Corporation's annual report records a good year for the chit fund with a turnover of Rs. 3.3 crores and a dividend of 21 per cent. It reviews the working of the Tamil Nadu Chit Funds Act which is in line with the recommendation of the Banking Commission, and suggests that Maharashtra and other States which have no safeguards against the misuse of chit funds by their operators should enact similar legislation to that of Tamil Nadu. This is an area where financial integrity must be strictly enforced and adhered to.

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**Education, Science and Health**

*Educational Reform* : The projects recommended by the Task Force for Education, Science and Technology in its final report, summarised in the last issue of the Bulletin, for the Perspective Plan period have been examined by the State Planning Commission. Over 60 per cent of them aimed at extending minimum education for all citizens, functional literacy and vocationalising secondary education have been included in the State outlay sector for the Fifth Plan amounting to Rs. 120 crores. The projects for qualitative improvement of education, university reform and science and technology amounting to Rs. 52 crores have been included in the Central Sector. Some of the recommended reforms are being put into effect. The Nemmil Panchayat Union in the North Arcot district has established a Rural Education Development scheme to provide compensatory and supplementary education for the 33,000 students in its 76 schools. The students are being helped to develop fully their educational skills and the teachers are being provided with professional skills including the latest teaching aids, backed by research on rural educational problems on stagnation, dropouts, parent attitudes etc. It has published a comprehensive handbook for teachers and runs a series of seminars and orientation courses for teachers in improved methods of teaching and for revising the content of the various subjects taught in school. Another school in St. Thomas' Mount is organising an out of school education programme for dropouts between classes VIII and XI in order to train them in practical and professional skills to bring them to the level of the S.S.L.C. The Minister of Education of the State has once more suggested that school hours be shifted to between 7 a.m. and 1 p.m. in order to improve efficiency and attendance. Such a change would also enable a second shift to be operated and thus make for fuller use of existing facilities. He has also called attention to the secondary place occupied by the Country in spite of its vast resources as compared to other countries, primarily because our education is geared to passing examinations and

acquiring diplomas and not building skills. The Rajya Sabha debated in its August session a resolution calling for "a complete overhaul of the educational system" at which the Union Minister stated the Country was ready and the time was propitious for a wide ranging educational reconstruction. In the August session of the State Assembly a bill to regulate the conduct of mismanaged private schools was introduced and was referred to a Select Committee. In view of the mismanagement in some schools, their financial laxity and lack of audit, the receiving of donations for admission and teacher appointments (See Vol. II No. 8 of the Bulletin), the poor service conditions of teachers, the bill regulates the establishment of those private schools and the conditions service of their teaching and non-teaching staff. The school management will not be allowed to close the institution or a class without prior approval or transfer their property and will have to submit annually a list of their properties and audited accounts. The bill also regulates the appointment and conditions of work of the staff. It provides for the take over of the management of a private school, in case of mismanagement, by government for a period not exceeding five years. The well run private institutions have nothing to fear from this long due regulatory measure. At the college level, the Delhi University Reform Bill which seeks to provide for the setting up of autonomous colleges in that huge, overgrown university and some separation between under-graduate education in the colleges and post graduate research in the university, through the forming of 3 college councils in the university area has run into opposition by the Delhi University teachers. They are afraid that their status would be reduced to that of second class teachers, vis a vis the university teachers. These groundless fears expressed in strikes and demonstration has led the Union Minister to blur the main thrust of his reform proposals. In this State this particular problem will not arise as there are differing conditions of service for university and college staff. Despite the recommendation of the Task Force that liberal arts colleges be stabilised and not increased within the State, a new government arts college at Vyasarpadi in North Madras is being founded to start functioning from the next academic year. This proliferation of colleges must stop because they simply add to the number of unemployable graduates in the State. They represent at this stage of the State's development a disinvestment. In Kerala, in the context of the dispute and closure of private colleges a new institution has been founded—a college that is to be run and managed by the students through the Kerala University Students Union. This experiment will be watched with interest by the Country to see if the students can devise an educational programme which is innovative, skill based and skill forming. The Calcutta University's academic Council has recommended a 2 year intermediate and 2 year degree course. The West Bengal Minister of Education has recommended a 2 + 3 programme. This issue which was discussed at the Annual Seminar of the Association of University teachers (as referred to in a later section) is the subject of one of the recommendations of the Task Force.

The tragic increase in the number of illiterates in the Country and their age, sex and urban-rural location is brought out in the recent official review of the 1971 census. We have 88 million more illiterates now than in 1951, having reached the staggering total of 286 million illiterates. This is an indication of the ineffectiveness of our current educational system,—both school and out of school. While 30 percent of literacy is our national average, the sex imbalance is worrisome, women being less than half as literate (at 18.5 per cent) as men (at 39.5 per cent), and urban people being almost double in the number of literate (at 61.5 per cent) as those among our rural people (at 33.8 per cent).

In the rural areas 87 per cent of women are illiterates. The older people are more illiterate and even in the young working age group of 15–30, the illiteracy is 60 per cent. This State belongs to a small group of four States where the literacy percentage ranges from 40 per cent (Tamil Nadu) to 60 per cent (Kerala). Our illiteracy situation is not only a moral and social scandal, it is a grave obstacle to the development programmes foreseen in the Fifth Plan. The primary cause for illiteracy is the irrelevance of the present educational system to the needs of the student and adult and the small effort made to functionalise all education, particularly adult education. This is the crying need today and it is to that, that the State's Perspective Education Plan is addressed.

*Technical Education*: The State is establishing an Institute of labour studies to educate and train workers in labour legislation and industrial relations. It will help to prepare the leadership of our trade unions through training the theoretical and practical aspects of our labour laws, in labour economics and through study by workers. The Institute should be under the control of all our trade unions. The government department of technical education has abolished the meaningless oral and practical mechanism test in typewriting. The student who learns typewriting knows how to clean and oil the machine, change the ribbon, cut the stencil etc. The test is a money waster for the student and time consuming for him and the examiner—as it tests nothing which has not been tested when the student takes his typewriting examination. This kind of lightening and rationalising of the examination system must be undertaken in parts of education even before the examination is replaced by a rational evaluation system.

*Science*: On the occasion of the Country's silver jubilee, the CSIR has in a publication reviewed its work since 1942 when it started with a grant of Rs. 5 lakhs and is now spending Rs. 22 crores annually in 44 laboratories staffed by 10,000 scientists. The Central Electronics Engineering Research Institute has developed the excitation control system for diesel electric locomotives, thus saving Rs. 30 lakhs in foreign exchange. The TV receivers designed by it are now in production. The National Chemical laboratory has devised the process for making ferrites of hard, soft, and professional grades, saving Rs. 27 lakhs a year in foreign exchange. Its process for producing actanilde has now gone into production at the rate of 2,000 tonnes per annum by Hindustan Organic Chemicals. The National Physical Laboratory's electronic desk calculators will save Rs. 4 crores. The CLRI's contribution has been referred to earlier. The Central Glass and Ceramic Research Institute has developed bricks from waste mica, optical glass, infra red glass etc. saving Rs. 2.5 crores a year. The Regional Research laboratory at Hyderabad has developed hydrogenated castor oil now earning Rs. 75 lakhs in foreign exchange annually. The Central Fuel Research Laboratory in collaboration with other laboratories has developed Ion exchange resins from a number of sources, with a production value of Rs. 60 crores. The Central Food Technological Research Institute's process for baby food has saved the Country Rs. 9 crores in annual imports. The Structural Engineering Research Centre has developed use of reinforced concrete to save on steel, which amounts to Rs. 45 crores per annum and when used as transmission towers could save Rs. 80 crores. All this a heartening record but it is one which touches only the fringe of the Industrialisation and import substitution programme of the Country. The new relations being developed by the laboratories, who are visiting the industries individually and discussing with them freely and fully how the CSIR programme could be reoriented to serve the Country's manufactures, should produce even more impressive and solid results. Another CSIR

initiative is the application of technology to the backward regions. It is adopting districts in which it will study the resources and skills available, and the technological inputs needed for an integrated development of housing, health, roads, communication, agro based industries, marketing and finance of the district. This programme of technological development of the districts is being planned with the help of the local authorities and the State government.

The Trivandrum Seminar on reinforced plastics replacing high strength steel and aluminium alloys which are in short supply has established a priority research programme in that area. The Cochin Seminar on Marine Fisheries has similarly agreed upon a research programme in the fisheries field which will be undertaken by various stations to make up our lag in the last 25 years.

Space research is another area where the Country is making decisions as to priorities and programmes. The new department of Space and its Chairman who is also Secretary to government, has before it an important programme initiative (See Vol. II No. 8 of the Bulletin). The programme priorities are a programme of research and development of the components, devices and sub-system for the ground and space segment, facilities for satellite and sub-system testing and qualifying these for space use through simulation. The project will cost initially Rs. 175 crores for deploying Indian made communication satellites in 1980, if the above priority programmes are completed by then. It will involve 5 receiving and transmitting earth stations, 20 receive only earth stations linked to TV transmitters, 200 limited rebroadcast facilities for 1,50,000 villages, and the use of the entire satellite for telecommunication and television programmes. The Fourth and Fifth Plans' 8,500 route KM plus 3,700 route KM broad band micro wave network with satellite transmission will cover 95 per cent of the Country. This configuration will lead to self reliance in this area. The detailed programme, the hybrid terrestrial cum satellite television, will cost around Rs. 300 crores over the next 15 years. Reasonable capacity for linking cities through trunk telephone service and for reaching remote areas through telecommunication links are also provided. The timing of the programme is : (a) the building of the scientific satellite with the help of USSR in 1974, (b) the satellite instructional television experiment using ATS-F in 1975-76, (c) proving and launching Instal-I in 1976 and Instal-I-two as a backup satellite in 1978, (d) The first Indian made Instal-II-one will be launched in 1981 and the second in 1986.

*Health :* The recommendations of the Task Force on health, family planning, nutrition, and sanitation for the Perspective Plan period which were summarised in the last issue of the Bulletin are being used by the State Planning Commission to frame the health, family planning, nutrition and sanitation projects for the Fifth Plan. The State outlay in this sector is Rs. 150 crores and the Centrally sponsored projects are for Rs. 88 crores. One of the proposed Centrally sponsored projects—the using of indigenous doctors, has been approved for all States. The project will start next year on a pilot basis in every State, using 50,000 indigenous doctors at a cost of Rs. 1.8 crores and will use an additional 1,00,000 in 1974-75 and a further 1,00,000 in 1975-76 at a cost of Rs. 180 crores for these two years. Under the scheme, in the mini-health centre an indigenous doctor's post will be provided for every 2,000 of the population, so that the average mini-health centre in Tamil Nadu will have 5 such posts. They are to be called Registered Medical Practioners (RMPs), will be recruited from the mini-health centre

area and will be under the administrative control of the mini-health centre doctor for purchase of medicine, preparation of statistics etc. The RMPs are to be given four months training in the available ayurvedic, homeopathic, unani and siddha hospitals in the State, during which time they will draw Rs. 150 as honorarium and Rs. 150 as dislocation allowance. Their salary will be paid from a health cess on each prescription, which will be 25 paise on those having 11 acres of land, 10 paise on those having 3-11 acres and free for those with less than 3 acres. Each RMP post will carry a revolving fund of Rs. 2,000 for medicines. This Central scheme in terms of the cess will have to be adapted to our conditions in the State, which is also provided in the scheme. It is a 10 year Centrally sponsored scheme. The Central government health service scheme referred to in the last issue of the Bulletin is being extended to other metropolitan cities. Its extension to the lower income and poverty sector group which should be the major item—will be possible if the structure for rural medical services proposed for the Fifth Plan is fully carried out. The next stage is to extend this service to all State government employees. Another project recommended by the Task Force—the starting of a Homeopathy College in the State has been approved by the government and is to be acted upon. The State Homeopathy Council has now been established in accordance with the recently passed State bill and its first task is to register the 10,000 practising homeopaths and to start the college. To follow up the startling results of school students' poor health conditions revealed by the North Madras Survey reported in Vol. II No. 6 of the Bulletin, the government has launched a school health programme for the age group 5-9 (classes I—IV) providing medical check up and follow up treatment to 1.2 lakh children in the city schools. It will involve an expenditure of Rs. 9.6 lakhs for the last two years of the current Plan and Rs. 29 lakhs in the Fifth Plan. The programme will be executed by medical personnel attached to special medical cells to be created in six city hospitals - General, Stanley, Kilpauk, Womens, Kasturba and Royapettah. On the basis of this experience, the scheme will have to be extended by stages to all schools—particularly to those in the rural areas. In view of our resources constraint, priority should be given to this age group in the schools in the State.

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**Employment** :

Parallel to the disquietening trend of the rate of increase in educated unemployment discussed in the last issue of the Bulletin, the Union government has now released general unemployment statistics which show a similar rapidly rising trend. As at 30th June, 1972, 57,00,000 job seekers were registered in the employment exchanges, compared to 51,00,000 job seekers six months earlier, at 31st December, 1971. We are thus adding 1,00,000 unemployed every month in the urban areas alone, where employment exchanges function. The accelerating trend of unemployment is seen in the registered unemployed being 34,00,000 on December 31, 1969 and 40,50,000 on December 31,1970. Tamil Nadu stands third among the States with 4,60,000 unemployed. In this situation our efforts at the national and State level to deal with this priority problem lack coherence. There are too many fragmented, ad hoc, crash and improvised programmes and proposals and their rate of execution is unsatisfactory. The formulation of the Fifth Plan during the remaining 18 months of the current Plan provides an opportunity not only to increase the outlay on unemployment generating schemes as is proposed (a doubling to Rs. 7,800

crores) but to develop and implement a comprehensive and coherent policy. In a vast country like ours there will have to be many diverse initiatives but the core should be clearly directed and this requires decentralisation of programme formulation as well as execution to States, districts, and blocks. There is agreement on giving priority to employment generating projects in the Fifth Plan, which means labour intensive technologies including the small farmers, marginal farmer and dry farmer schemes. In this context the Bhagwati Commission's recommendation to provide differential rates of excise duties and subsidies to employment generating projects is a corollary of the strategy and should be incorporated in it. The Maharashtra need based employment guarantees Plan is another coherent instrument. Meanwhile the Planning Commission's analysis of the execution of the Rs. 50 crores crash programme for 1972-73 shows the same tardiness as last year's performance. So far only Rs. 11.84 crores have been released to the States and probably Rs. 1 crore has actually reached the unemployed. Once more the urgent need to streamline procedures and decentralise responsibilities is urged. In this State the August session of the Assembly approved the Rs. 8.97 crores supplementary estimates which include the Rs. 3 crore rural roads programme which will provide employment to 15,000 workers. Another programme, based on last year's lesson of spreading our limited resources too thinly over too wide an area, is a Rs. 1.5 crores Pilot Intensive Rural Employment Programme (PIREP) which has been launched in 15 selected blocks in the Country. In this State Rs. 15 lakhs are to be expended on this employment project in the Mangalur block of South Arcot, with a population of 1,00,000.

On the educated unemployment problem, the statistics analysed in the last issue of the Bulletin means that around 20 per cent of our total graduate and post graduate manpower stock (in all areas of science, agriculture, arts, commerce, medicine, engineering) is unemployed in the Country. This is a truly depressing situation. The figures have been officially placed before the Lok Sabha at its August session. In Tamil Nadu, the government reports that as at 31st December, 1971, out of the 4,60,000 unemployed recorded in our live registers –(not including the rural/agricultural sector), 1,53,384 are SSLCs, 14,024 are B.A., B.Sc., and B.Coms., 24,926 are engineering, medical and other professional graduates and 2,732 post graduates. There are the usual frictional factors such as unemployed doctors and nurses on the one hand and unfilled medical and nursing vacancies in the rural areas on the other. This situation can only be dealt with by restructuring the education system and restricting admission to college education. It is good news that the selective admission in our agricultural university has resulted in employment of all its 250 graduates last year and 223 this year. Only employment should not be conceived solely in terms of government employment as in this case. It is hoped that some at least of the 1,600 youth Corps men and women graduates being recruited this year would set up their own work units. The Union government's Rs. 20 crores for technologists and scientists employment in preparing projects for the Fifth Plan, the Rs. 10 crores technician assistance scheme should be self employment generating programmes. On educated unemployment, all the facts and data are available. The task now is to plan for an economy which can use their important and varying levels. This can be done, as this State intends to demonstrate in its Perspective Plan.

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**Peace Research In India :**

Gujarat Vidyapeeth, going back to the basic faith of its founder, Gandhiji, has established the first university Peace Research Centre in the Country. It is also a follow up of the International conference on Science and Culture in Gandhi's teaching organised there during the Gandhi Centenary year. The Centre has a small interdisciplinary staff and to establish its programme of work it organised a national seminar on the themes and methodology of peace research in India. The seminar was attended by fifty specialists in all the social science disciplines, under the direction of Prof. Sugata Das Gupta who is the Country's leading researcher in this area—Peace research in India and for India is not the peace research as understood and undertaken in Europe and North America—nuclear tests, space missiles, how to prevent nuclear war, etc. Very largely under Prof. Das Gupta's guidance it has come to mean what is generally known as Development Research—with special emphasis on those factors in our Country which hinder development. It was agreed that our research will deal with all forms of peacelessness in our Country, which trace back to our geo-political relations with Pakistan and China on the one hand and to various forms and causes of what Mr. Das Gupta calls maldevelopment in the Country. Peace research will thus in Gujarat Vidyapeeth and the Gandhi Bhavans concentrate on these national sorespots of ours and indicate the way out for peace activists. At the time of the seminar, the second meeting of the Indian Council for Peace Research was held when the programme and budget for 1972-73 was established. The programme will sponsor two or more research studies on the above lines and organise 3 sub-national conferences and one Asian conference in 1973 with the cooperation of Unesco. It also decided to approach our private sector foundations for financing the Council.

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**Education Reform Discussions**

The Association of University Teachers of Tamil Nadu ran a seminar on the pattern of higher education in the State. They agreed that the time was ripe for the reform and restructuring of education in the State and assumed that school education would be restructured into a 10 year stage, with universal skills at the first level provided to all children and adults and a vocationalised secondary education. Against this background, they agreed that the pattern of higher education should be a function of the objectives of employability and excellence. From this, it was recommended that the present one year PUC should be abolished and a 2 year Junior degree course which would be both terminal in terms of the skills imparted and a step to degree programmes. The degree programmes could be a 2 year or 3 year programme, with a preferance to the 3 year alternative. Admission to both Junior and degree courses should be selective. The Association is in the forefront of educational discussion and thinking in the State, paying attention also to the conditions of service of the teachers.

The Association of Managements of Private College also held its annual conference in August on the theme, Private Colleges in the Service of the Nation. It is time that private colleges re-examined their role and function in a society where the State is emerging as the dominant force. There is a place,—very important place,—for private colleges, provided they pioneer the way to the educational regeneration that we need, to estab-

lishing educational standards of the quality needed by our people and students. There was a plea for closer consultation between the government and the private colleges with regard to educational reform and development—a plea readily accepted by the Minister of Education who inaugurated the conference. There was also a plea for the Association to establish for itself a code of conduct and a self policing arrangement so that these managements who use their position for racketeering in the fees and donations charged, who maintain unfair conditions of service for their staff may be brought to book and face sanctions by the Association.

Madras institutions have some 2,000 students from other Asian countries, Africa, Europe and the Americas. The August 15 silver jubilee celebrations was an occasion when these students were entertained at a reception by the Madras Office of the Indian Council of Cultural Relations. It provided an occasion for Indian and overseas students and educators to review the Country's achievements in the 25 years and the challenges that lie ahead of India and the third world in the coming 25 years, which will also be the end of the current century.

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**Indian Institute of Technology, Guindy**

The Indian Institute of Technology, Madras organised its 9th convocation at the end of August when some 600 graduates received their Ph.Ds., M.Scs., M.Techs. and B.Techs. Only a quarter of the graduates were present to receive their diplomas in person, because all of the outgoing graduates are already employed and most of them could not secure leave of absence for the ceremony. The ceremony was well organised and made impressive by the Director and Staff of the Institute. This group of elitist institutions, the five IITs and the two Indian Institutes of management maintain the highest standards of excellence and their products are in great demand. They face no unemployment. The plea at the convocation was for the outgoing scientists to provide the managerial ability to pull the Country's industry out of its stagnation. For this we need to move on to the next stage of merging the IITs and IIMs to help produce the new kind of scientist entrepreneur that our economy so badly needs.

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**Indian Institute of Science**

The Indian Institute of Science, founded by J. N. Tata in one of his many far sighted initiatives for the Country, is the only institution in the Country which combines fundamental research with design engineering. It brings together the IIT type of high level engineering education and research along side of being one of the leading fundamental research centres of the Country. Because of its research results and location, it is working on many programmes for the Ministry of Defence and is one of the two centres in Space research. The Sixth J. N. Tata lectures was delivered on September 1, under the presidentship of Mr. J. R. D. Tata. The lecture appears in a later section of the Bulletin.

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**Seminar on Techniques of Perspective Planning**

A further set of documents sent to participants in the Seminar on Techniques of Perspective Planning during September include: Regional Planning–Concept and Process by Mr. E. C. P. Prabhakar (Paper No. 8). A Tentative model for Instituting Progress for Backward Region by Mr. E. P. W. Da Costa, Paper No. 7, Researches and Contraints by Dr. T. S. Venkataswamy (Paper No. 10).

The Seminar was not held on September 15 and 16 as foreseen and has been postponed to October 20 and 21 in order to provide further time for adequate preparation.

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**Meeting of Heads of Departments of Economics of Southern Universities**

The Madras Institute of Development Studies in cooperation with the Indian Council of Social Science Research is organising a meeting of the Heads of Department of Economics of the 14 Universities of the States of Andhra Pradesh, Kerala, Mysore and Tamil Nadu on December 15 and 16. The meeting will consider: (a) A proposal to introduce a methodology course in M.Litt/M.Phil. and Ph.D. programmes in Economics on the basis of a paper by Dr. V. Shanmugasundaram, Professor and Head of the Department of Economics, Madras University. (b) The results of the Second Workshop on Economics Research Methodology on the basis of a paper by its Director, Dr. B. Sarveswara Rao. (c) Examine the proposal to organise a two week refresher course for Professors who are guiding Ph.D. Economics research scholars in the 14 Southern Universities—on the basis of a paper by the Director of the Madras Institute of Development Studies. (d) The exchange of views on the status of economics research in the Southern Universities on the basis of Papers submitted by members. (e) The proposal for an Economics text book for India, on the basis of a paper by the Director of the Madras Institute of Development Studies.

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**September Madras Development Seminar**

The paper on Religious Values and Science presented by Dr. C. M. Abraham, Reader in Sociology, Madras University at the September Seminar together with a summary of the discussions of the seminar, chaired by Mr. R. Ramanujam, Professor of Economics, D. A. Vaishnav College, appears as the first article.

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**Second Article**

Another article, Growth: Its imperative and limits, appears as the second article.

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**Book Review**

At the specific request of the Director, Vaikunth Mehta National Institute of Cooperative Management, Poona, its Report on Cooperative Tea Factories in India, which concern mainly Tamil Nadu is reviewed in the concluding section.

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# SCIENCE AND RELIGIOUS VALUES

by

DR. C. M. ABRAHAM,

*Reader in Sociology, University of Madras.*

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" Science without Religion is lame,
Religion without Science is blind. " —Albert Einstein.

" The future of the world is tied up with the growth of science, and life becomes more and more dependent on science. At the same time life with science only as its guide and without a spiritual basis is very likely to lead to disaster for humanity "

—Jawaharlal Nehru.

**The Age of Fulfilment and Enlightenment**

We are living in an era of fulfilment and enlightenment. Dreams of mankind which had remained utopian for millennia are now so nearly fulfilled. For instance, imaginary travels to the outer world and to the moon by a host of writers beginning with early Greek scholars, and continuing with Plutarch, Cyrano de Bergerac, Jonathan Swift, Jules Verne and H. G. Wells, have now become realities and of interest to the common man. Likewise many of the long cherished needs and hopes of mankind have been fulfilled by science during the present century.

In this age of enlightenment, science has spread its roots into all we do and think and feel, and has helped in the flowering of our civilisation. Science has won a measure of freedom for the human mind and a degree of control over physical forces. The insight and facilities we owe to science are invaluable.

Freedom and reason are the two great forces of our times. In fact, Sir Richard Livingstone labelled the twentieth century as the child of liberalism—that is, of freedom and reason. He says that " the greatest service of freedom to mankind is that it unties the hands of reason and sets her free. Once free she breaks the fetters of prescription and prejudice, exposes superstition, fanaticism and intoleranee and forces and helps men to see things as they are. She shows them.

The high, white star of Truth,
There bids them gaze, and there aspire.

She brings things out of the dark part of our mind into the light part of it; summons tradition and custom to the bar of her tribunal and compels them to justify their claims

to respect, points out absurdities and injustices, tells us whether our conduct is consistent with our principles; she tests our ideas on the touchstone of fact." (Sir Richard Livingstone. Education and the Spirit of The Age, Clarendon Press, Oxford, 1952, p. 15).

**Reasons for the late development of Science**

Though man has existed on the planet for about a million years, science as a dominant factor in determining the beliefs of educated men, has existed for about 300 years; as a source of economic technique for about 150 years. (Bertrand Russell. The Impact of Science on Society, Blackie and Son (India) Ltd., Bombay, 1965, p. 25). Since there is no reason to assume that the human brain was less well endowed in antiquity than it was during the Renaissance when the modern scientific attitude developed, historians have found it necessary to search for the reasons that had inhibited the growth of science. Rene Dubos quotes two reasons put forward by historians. The first one is the widespread practice of slavery which prevented the Orientals and the Greeks from engaging in ordinary manual labour and thus deprived them of the inspiration that can be derived from intimate contact with concrete problems. Slave societies it is claimed do not have the urge to create effort-saving processes and equipments. It has been pointed out also that the form of Christian doctrine which prevailed in Europe until the reformation weakened human interest in the affairs of this world by placing too much emphasis on the after-life. Thus two aspects of the social changes that occurred in the post-medieval era would have contributed to making conditions more favourable for an awakening of the modern scientific attitude: on the one hand, the emergence of the bourgois and artisan classes with experience in the concrete affairs of the world; on the other, the more material and wordly attitude that began to develop throughout Europe at the time of Renaissance. (Rene Dubos. The Dreams of Reason, Columbia University Press, New York, 1961, p. 17).

But these two explanations are not convincing. Rene Dubos points out that in the early period the number of slaves in Greece was far smaller than is commonly assumed and that much of the physical work of every day life was carried out by free men. As to medieval civilization, there is no reason to believe that its Christian faith, however deep, interfered seriously with the enjoyment of material pleasures. History will bear evidence to the fact that certain machines and gadgets—such as mechanical clocks—were popular during late medieval times. In the absence of complete and convincing explanations, Renc Dubos assumed that the ferment which agitated the men of the Renaissance led them to undertake scientific studies as a way to manifest their spirit of independence and their desire to do things, whatever these things might eventually turn out to be. (Rene Dubos. Ibid. pp. 17-18).

***The Origin of Scientific Tradition.***

Science is a process. But when did this process begin? It is as hard to answer this as to answer the question, when does a man begin to grow old?

The Protestants claim that the seeds of liberalism—that is, of freedom and reason—were sown in 1517 when Martin Luther, pinned up his ninety five theses against indulgences on the church door at Witterberg. Until that time, almost all Europe was bound in the fetters of ignorance, accumulated rubbish of centuries, anachronisms, absurd taboos. Bertrand Russell writes that science after a fitful flickering existence among the

Greeks and Arabs, suddenly sprang into importance in the sixteenth century and has ever since increasingly moulded both the ideas and the institutions among which we live. (Bertrand Russell. *Religion and Science* p. 7).

Thus the sixteenth century witnessed the sprouting of the creative dynamism of science and the subsequent centuries the successive phase in the advance of the extension of scientific inquiry from the physical to the biological, medical, social and ultimately psychological realms. *In all these fields we notice the* overthrow of teleological categories of explanation dear to medieval theology and their replacement by the concept of efficient phenomenal causality.

**What is Science ?**

"The quest for the real, the verifiability of assertions, clarity in the definitions of the terms employed, consistency in the affirmations stated in these terms, and humble respect for all the discoverable facts relevant to the problem under study are all fundamental to the practice of science—constitute, indeed, its very bedrock." (Rene Dubos, The Dreams of Reason. p. 5)

According to Bertrand Russell "Science is the attempt to discover, by means of observation and reasoning based upon it, first particular facts about the world and then laws connecting facts with one another and (in fortunate cases) making it possible to predict further occurrences. Connected with the theoretical aspect of science there is scientific technique which utilizes scientific knowledge to produce comforts and luxuries... it is this latter aspect that gives such great importance to science even for those who are not scientists." (Science and Religion. p. 8) Russell points out that science has two functions (a) to enable us to know things and (2) to enable us to do things. Nehru was often fond of saying that science is not only thinking but also doing.

Here Russell presents science as static, whereas it is intensely dynamic. The most important attribute of science is not knowledge, but its capacity for acquisition of knowledge. The knowledge which science contains, is frequently fragmentary and hence always liable to revision. The capacity of science to acquire knowledge is infinite.

Science, thus is no static body of knowledge, but rather an active process that can be followed throughout the ages. By derivation scientific implies knowledge making and no body of doctrine which is not growing, which is not actually in the making can long retain the attributes of science.

**The Message of Science**

Man's hope lies in the advance of civilization. Science is part of it. To understand its role requires insight into science's nature, power and limitations. Paul Weiss a noted biologist brings out the nature, power and limitation in the following three points.

1. That man will continue to reap rich fruit from scientific progress.
2. That understanding the process of science—not just its products-understanding science as a way of thinking, gives man a firmer grounding in reality against his floundering and fumbling in abstractions.

3. And that science's task is to serve man mastering nature, and not to become man's master. In serving man, science must close ranks with other servants of humanity—the creative arts, philosophy, religion-all striving for a new integrated humanism. Science, which has helped dethrone man from the self-appropriated station at the centre of the universe can help him now to grow into his rightful stature. (Paul Weiss. The Message of Science in Contemporary Readings in General Psychology, Second edition, Edited by Robert S. Daniel, Houghton Mifflin Company, Boston, 1959).

**The Conquest of Science.**

The scientific revolution of the 16th century and the events that have occurred thereafter are unique. What makes them so, is the advent of modern science. Modern science has re-oriented man's thinking about the nature of the world in which he lives and through its technological fruits has transformed their institutions. The whole of modern times has been one vast slow revolution, a revolution still proceeding. The intellectual and cultural revolution has passed through many phases as one area after another has been yielded reluctantly as a proper field of scientific inquiry.

The gradual conquest of science begins with what is most remote from man's inclinations and desires—mathematics astronomy and physics. The first period of the expansion culminates in the synthesis made by Newton at the end of the 17th century. But it is not until the 19th century that a real beginning is made in the historical science—those for which time is the focal point—of geology, biology and sociology-by men such as Lyell, Darwin, Comte, Spencer and Marx. Finally the innermost citadel of resistance to the scientific method, the human personality itself, is attacked by Freud, and the last pretence that we can know reality as it is in itself, the very quest for certainity, is abandoned in principle with the general acceptance of Einstein's theory of relativity. (Gail Kennedy (ed) Evolution and Religion, D.C. Heath and Company, Boston. p.v.). Science with its great aim to make the world intellgible or at least describable, has by its very success been riven into many departments. Bertrand Russell writes " the sciences have developed in an order the reverse of what might have been expected. What was most remote from ourselves was first brought under the domain of law, and then gradually what was nearer: first the heavens, next the earth, then animal and vegetable life, then the human body and last of all (as yet imperfectly) the human mind. (Russell. Science and Religion. p. 49).

**The Impact of Science on Society.**

In this work which was published in 1962 on Bertrand Russell's eightieth birthday, he is concerned to apply his vast range of knowledge and his profund intellectual resources to an examination of the consequences on society today and in the furture, of the great revolution which has taken place in scientific knowledge and technique. He suggests in dramatic form what is so rarely appreciated in the Western world, the compa-

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Russell gives a wider definition of science. " Science as its name implies, is primarily knowledge; by convention, it is knowledge of a certain kind, namely which seeks general laws connecting a number of particular facts. Gradually however the aspect of science as knowledge is being thrust into the background by the aspect of science as the power is manipulated nature.

ratively recent development of scientific ideas during the 17th and 18th centuries in acting as a solvent of the many traditional beliefs of earlier days. He claims that the great contributions of 17th century thought were:

(a) the emphasis which it laid upon the importance of observation as against the acceptance of tradition,

(b) the development of the conception of natural law as governing the whole organization of the universe both on its material and on its biological side,

(c) the recognition of the fact that the earth was not the centre and that man was not the purpose of the universe. This 'dethronement' of 'purpose' was fundamental to the development of science in the 18th century. As Russell says, although it is still open to the philosopher or the theologian to hold that everything has a purpose, it has been found that purpose is not a useful concept when we are in search of scientific laws. Russell points out science has degraded man in one way, as far as contemplation is concerned, since it has reduced him from a centre of the universe to an infinitesimal speck in cosmic life, but at the same time science has exalted him by providing him with almost unlimited capacity to exert power. (L.F. White, Introduction to Betrand Russell's book—The Impact of Science on Society, Blackie & Son (India) Ltd., Bombay, 1965. pp. 15-16).

**The Results of Science**

Francis Bacon epitomizes science as knowledge and knowledge as power. He sought to know nature's innermost secrets in order to extend "human empire over all things possible", while he had no sympathy whatever with the demand for immediate practical applicability of every scientific discovery, he saw in applied science the ultimate justification of theoretical science. "Light-giving experiments" to use his own words were valuable chiefly because they make possible "fruit-bearing experiments". Inspired as he was by such revolutionary inventions as printing, gunpowder and the compass which as he said, had changed the face and state of things in all the world" so that "no empire, no sect, no star, seems to have exercised a greater command and influence over human affairs than have these mechanical discoveries," he believed that by the use of scientific method inventions and discoveries of all kinds might be made almost at will. Critically conducted experiments would disclose the laws of nature; knowlede of these would usher in an age of invention; invention of mechanical contrivances would enable mankind to win dominion on earth. (Max Otto. Science and the Moral Life, Mentor Book, The New American Library of World Literature, Inc. 1949. p. 79.)

The idea in Bacon's mind was simple and clear. It was to domesticate the untamed forces of nature as wild horses had been domesticated, to put them into harness, hitch them to the human enterprise, invite mankind to climb in and ride away to wealth, health and felicity. The vision of innumerable powerful horses champing at the bit was so entrancing that the question of driver and destination seemed hardly worth thinking about. "Only let man regain his right over nature" he enthusiastically exclaimed, "let him be given the power: right reason and sound religion will teach him how to apply it." (Ibid. p. 79).

Bacon suspected that knowledge when placed in unworthy hands, might come to be used for destructive and cruel purposes, but this did not dismay him. "If the debasement of arts and sciences to purposes of wickedness, luxury and the like, be made a ground of objection, let no one be moved thereby. *For the same may be said of all earthly goods; of wit, courage, strength, beauty, wealth, light itself.*" So great was the role of science as envisioned by Bacon that he wanted to see practical steps taken to help scientists fulfil their social responsibilities. It was the richness and convincing beauty of Bacon's language that made the world at large take notice of scientific knowledge as an instrument of power and of social growth, thus launching us on the road that we are still travelling today. No one questions any longer the fact that science is increasing the dominion of man over nature. This does not mean, of course, that man will recover through scientific technology the happiness that Adam knew before the Fall, as Bacon hoped. (Rene Dubos. The Dreams of Reason. Columbia University Press, New York, 1961, pp. 27, 28 & 38)

**Man Conscious of his Power and his Importance**

Never in the history of mankind, was man so conscious of his power as he is today. Science and technology dangle before our eyes a glittering glamour world of their making. Discoveries in physical science have been piling up so rapidly and our rate of accumulating knowledge of the universe is so high that even the experts in the field find it difficult to keep pace with the developments.

The contrast between man's amazing ability to manipulate his material environment and his pitiful incompetence to manage his own affairs is now as commonplace as it is tragic. The world of atomic energy is for millions still the world of poverty, hunger, misgovernment, crime, juvenile delinquency, domestic unhappiness or personal frustration.

And mastery over sea, earth, air, space and atom has brought us only to daily fear of our own making. The tremendous titanic power unleashed by science and technology, has magnified to frightful dimensions the problem of its right or wrong application. Mankind faces the possiblity of total annihilation if it lacks the light, the vision and the valuation of wisdom. Aldous Huxley points out "Most prophecy tends to oscillate between an extreme of gloom and the wildest optimism. The world according to one set of seers is headed for disaster, according to the other the world is destined—within a generation or two—to become a kind of gigantic Disneyland (glorified heaven) in which the human race will find perpetual happiness playing with an endless assortment of ever more ingenious mechanical toys."

Dr. Herman Kahn, *Physicist and Director of the Hudson Institute,* U. S. A. pointed out that the benefits of the affluent society will not be accepted by all people. He writes that "along with our barbecue society, we're in for a lot of beatniks, revolutionary-type of movements and withdrawals from society......". The crowded, snailed, enervating, cosmopolitan life of 'tomorrow' in the view of science is rather *frightening.* It is, in the words of Armstrong and Armstrong, to be a fantastic, push-button dreams world of three L's—

Leisure,<br>
Luxury and<br>
Licence.

Dr. Kahn adds that the sharp change in work and leisure patterns in the push-button society could be trumatic to many who find such a life meaningless and purposeless and they look for something to fulfill them. They may find a new religion. There will be mass movements - both rational and irrational—cults a kind of privation, LSD without question."

Armstrong and Armstrong say that modern science has failed utterly to reveal to the world the purpose of human life or explain its true meaning. It remains ignorant of the true values. It does not know the way to peace. It has failed miserably to deliver the world from poverty, famine, disease, fears and worries, unhappiness. It has not rid the world of broken homes, crimes, insanity, immorality. Rather all these are on the upward spiral. (Herbert W. Armstrong and Garner Ted Armstrong. The Wonderful World Tomorrow, What it will be like. Ambassador College Press, California, p. 18).

A realistic look at the fruits of modern science leads only to disillusionment. Science and technology confine their attention to the realm of the material and the mechanical. Purpose and meaning human life? the true values? finding the way to peace, happiness and joy? These basics to human welfare are not their concern! These essentials are outside their field.

Look again to their fruits. True enough we find accelerating invention and production of intricate mechanical devices, labour-saving mechanisms that inspire awesome admiration, and spectacular entertainment and amusement devices.

But then we also observe that people have not been taught to put added hours, days and weeks of leisure to beneficial uses. The fruitage here is increasing idleness, aversion to the happiness of work, covetousness, desire for more and more – and dissatisfaction with it when it is acquired! They turn out, in practical application, to be false values, which only increase unhappiness. An increasing segment of adolescents with money to spend and nothing but idleness on their hands become frustrated, staring a hopeless future in the face, turning to immorality, violence and—too often—suicide! The leaders of tomorrow in this world are becoming the 'beat' generation!

And, after all, the principal contribution of modern science and technology has been the production of constantly more terrifying weapons of mass destruction. Push-button world! Yes, today either of two men could push a button and destroy two whole continents, probably culminating in the total extinction of mankind.

Modern science stands exposed as a false Messiah—the Frankinstein Monster threatening to destroy us all! (Armstrong and Armstrong. The Wonderful World Tomorrow, P. 20).

**What Price Science and Technology?**

Science today cannot be isolated from politics, or economics. This is obvious from the proceedings of the recent (June 1972) United Nations Conference on the Human Environment held in Stockholm, Sweden. This conference attributed pollution of the atmosphere as much to the sins of politicians as to the mechanics of modern industry and technology.

Human life is sustained by food, air and water. Today man is polluting his life sustaining supply of these three necessities at a fast accelerating rate. Milner S. Ball in his penetrating article 'International Environmental Action : Nature, Politics, Hope' (The Christian Century, May 24, 1972) points out how the environmental crisis is tied to technology. He says that our technology exacts a frightful toll for what it gives. The problems of technology require huge amounts of energy whose massive generation consumes natural resources and pollutes earth, air, and water. The products of technology include enormous amounts of sophisticated garbage, some of it virtually indestructible and some of it lethal.

Ball adds that there is no inherent flaw in technology to account for its destructiveness. The fault is not in our technology, but in us. Technology may have acquired a degree of independent momentum and may create values of its own, but it is still subject to our control. The reason why technology is an environmental disaster lies in the chief end for which we exercise this control. Our technology chews up the earth, exhales pollutants and spits nonsensical deadly refuse because we have bent it to the service of a spurious notion of self-preservation which is really self-indulgence. We have wrongly identified self-preservation with security and happiness. We frantically pursue immediate gratification of narrowly determined needs and do not consider inevitable consequences. Having misapprehended our own highest good, we do not act in our own best interest. So we demand of technology arms for war, goods for acquisition, bromides for escape from pain and banal culture for flight from joy. But instead of saving ourselves we are doing exactly what we most want and what we have created a technology to prevent : we are destroying ourselves. There is no constraint built into technology, no ultimate fail-safe device, to preclude it as an option for suicide. Technology does not raise prior questions. (The Christian Century, May 24, 1972; pp. 598-99)

Barry Commoner tells the story of how less destructive types of technology have been replaced by intensely destructive ones which are designed to meet separate, isolated problems and do not take side effects into account. The scientific foundation of technology, he points out, is governed largely by the notion that complex systems can be understood only if they are broken down into their components. This reductionist bias has also tended to shield basic science from a concern with real-life problems like environmental degradation (New Yorker, October 2, 1971, p.84)

Science cannot make the kind of fundamental evaluation which can prevent our self destruction . Says Commoner :—

> ...no scientific principle can guide the choice between some number of kilowatt-hours of electric power and some number of cases of thyroid cancer or between some number of bushels of corn and some number of cases of infant methenoglobinemia. These are matters of morality, of social and political judgment ; they are determined not by scientific principle but by the relative value we place on economic advantage and human life. (New Yorker, October 2, 1971. pp.84-85)

If science cannot render the necessary fundamental judgments, then neither can international diplomacy. *The reductionist bias which shields* science from "real-life problems" is answered in international relationships by a nationalist bias which tends to shield diplomacy from the common interest. At the bottom of both the environmental crisis and the practice of nationalism is an original error which darkens counsel by reading self-destruction as self-preservation. (Milner S. Ball, International Environmental Action : Nature, Politics, Hope. The Christian Century, May 24, 1972, pp. 598-599).

Few essays in recent years have caused so great a stir among theologians as Lyon White's "The Historical Roots of our Ecological Crisis". The summary of this article is as follows :— (1) Disastrous ecological backlash cannot be avoided simply by applying to our environmental problems more science and technology, for (2) what we do about our ecology really depends on our religious and philosophical idea of the man-nature relationship. (3) Ironically the dominant Western ideas of the man-nature relationship is rooted in the Judee-Christian world view, whose belief in man's dominance over a profane or disenchanted nature has produced the very science and technology which are despoiling our natural environment. (4) Hence, if we are going to survive the present ecology crisis, must either find a new religion or radically reconceive Christianity's vision of the man-nature relationship. (Summary given by James C. Livingstone in his paper entitled 'The Ecological Challenge to Christian Ethics' The Christian Century, December 1, 1971, p.1409).

White's essay continues to provoke debate on Christianity's responsibility for the ecological crisis. And the debate continues to produce much good discussion and some heated argument. Most important, it affords an opportunity for significant intellectual exchange among scientists, humanists, and theologians. Whether Christianity is the root cause of or a major contribution to our ecological crisis, however, remains a question on which there will continue to be considerable disagreement.

Frank Moraes in an editorial entitled What Price Science? (June 19, 1972, Indian Express), observes that obviously pollution of the human environment is the product of applied more than pure science, of the technologist more than of the scientist who is interested in science for the sake of science. Yet as Edward Appleton points out, *science today and even earlier cannot be divorced from the arts of life*. Frank Moraes quoting an article written by Appleton writes that Appleton affirmed that since science is an international activity there is no such thing as national science. However, he warned there is such a thing as a national attitude towards science—an attitude conspicuous by its presence at Stockholm.

**Direct Problems raised by Freedom and Science.**

Liberty and reason are essentials for progress. But they are not enough. Sir Richard Livingstone points out that though freedom strikes the fetters of the human spirit, it gives no indication what road it should follow yet, as Pascal says it is the nature of man to believe and to love, but freedom from itself cannot tell him where to fix his beliefs or his affections. He must learn that elsewhere. Likewise reason is an indispensable monitress and companion in life, but she is not a complete guide and like other good things she too has her defects. Kant indeed attempted to devise a practical working philosophy of life by the use of reason alone and others have followed him in a greater or lesser degree. But these doctrines have been more powerful in the study than in the world. In a personality with strong, clear beliefs or at least firm habits of conduct, reason purges the corruptions and errors of the mind. Otherwise reason may be a solvent, destructive force, the 'deep plausible skepticism' of which Newman spoke as 'the development of the human reason as practically exercised by the natural man...' For it is a powerful medicine and its acids attack not only the corruptions, but also the healthy tissues of the mind. Freedom is negative; it is a condition of the good life but does not tell us what the good life is. Reason is more helpful, but it is critical rather than constructive—a guide who can only show us part of our road.

Science is growing and will continue to grow. We recognise the uses of science or our debt to it, but it is impossible to ignore the dangers and problems which they have created. Now let us turn our attention to the direct problems created by science. For one thing it has upset our international relations by annihilating space. It has abolished distance, made the five continents adjacent countries has unified the world. Clearly in such conditions the international relations of the past are an anachronism, and fit the body politic as poorly as the clothes of a child fit a grown man. But we have not developed the outlook demanded by modern conditions and we still keep the isolated, provincial mind of an earlier age to which steam and electricity were unknown.– Nor is it easy to change our view. We still retain much of the outlook and habits of the past. To detach oneself from the traditions in which one has grown up and from the atmosphere which one breathes is very difficult. (Sir Richard Livingstone. Education and the Spirit of the Age. pp. 66-67).

Another problem created by science may be described as any embarrase de richesse. It has abolished poverty or at least has given us the power to abolish it, but this virtue has a defect which passes unnoticed. We are like the nouveause riches, who have come into a fortune but are too uneducated to spend it intelligently. Every capacity is a capacity for evil as well as for good and each addition to human power is a chance to misuse it, which men are quick to seize. Take printing as an example, and put into one scale the access to wisdom, knowledge and beauty which it has made possible, and into the other the falsehood, corruption and rubbish which the printing press has distributed to men : the latter scale would outbalance the former, if good did not weigh heavier than evil. Further, the very wealth of objects and enjoyments, good and bad, useful and useless, which applied in science has put at the disposal of a world that has not yet learnt to choose good and refuse evil, is a menace to true civilization. Needless to say, the fullest use is made of our weakness by advertisement, that peculiar development of the technological age. (Ibid. pp. 67-68).

Technology has impaired one of the purest enjoyments and major virtues of humanity—craftsmanship—replacing it by mass manufacture, turning the skilled worker into an automaton on the production line. making men richer in their possessions and poorer in themselves. Hence the protest of William Morris, Ruskin and Mahatma Gandhi saw as the greatest danger to true civilization the struggle between man and the machine for mastery. whether it appears in the degradation of the operative or in the unthinking exultation in mechanical achievement. The protests are sometimes extravagant, but the Age of Technology forgets and needs to remember the truth in Ruskin's words.

> "No changing of place at a hundred miles an hour, nor making of stuffs a thousand yards a minute, will make us one whit stronger, happier or wiser. There was always more in the world than men could see, walked they ever so slowly: they will see it no better for going fast... As for being able to talk from place to place that is, indeed, well and convenient, but suppose you have originally nothing to say! we shall be obliged at last to confess, what we should long ago have known, that the really precious things are thought and sight, not pace. It does a bullet no good to go fast: and a man, if he be truly a man, no harm to go slow: for his glory is not at all in going, but in being." (Ruskin, Modern Pioneers. iii. 320)

These are great and formidable problems which come wrapped up in the gifts of science. It is absurd to blame her : she is guiltless, it is our hands that are unclean. Science goes steadily about her work, revealing as she does it, the greatness of man, and if we misuse her, the blame is ours. There is no need to be corrupted or besotted by her

gifts, there is no need to employ atomic energy to destroy life instead of enriching it and aeroplanes can be used for other purposes than bombing. The remedy is in our hands. All that we need are the firm standards and clear philosophy of life, which distinguishes evil from good and chooses good and refuses evil. (Sir Richard Livingstone. Education and the Age of Reason. pp. 69-70).

When beliefs are false they must be discarded and no one can regret their disappearance. But that does not lessen the immediate crisis. This is the most difficult age in history. We have to master atomic energy; we have to see that civilization is enriched and not cheapened by the indiscriminate gifts of technology; and all the while the most difficult problems, economic, social and political and moral are pressing for solution. This is no moment to find ourselves with broken standards and uncertain principles. It is ill crossing a river in flood if you are not firm on your feet.

**The Indirect influence of science on the Modern Mind.**

*We often ignore this aspect—the subtle influence on the modern mind the results of* living in an atmosphere largely dominated by science. Great ideas run away with men, and there is no trait more constant in human nature than its habit of pursuing a truth beyond its proper province : a history of civilization might almost be written in terms first of the discovery of great truths and then of their exaggeration. That is a danger of which the Greeks were more aware than we, as is shown by their favourite proverb 'Nothing in excess' and their inclusion of 'Balance'; in the list of cardinal virtues. In his own field the scientist is no doubt rigidly objective ; he collects the facts relevant to a problem and make no conclusions that the facts do not justify. But, outside his subject and where his emotions are involved, he is no more objective or less liable to prejudice than the rest of us. Further the scientific approach to a subject is not confined to natural science but it is necessary in every field of study and habitual in any serious student. (Ibid. pp.73-74).

Education in natural sciences gives an inadequate view of the world. Living and dealing with atoms and calls are no preparation for living with men. Science should not overweigh the curriculum but be combined with humanistic studies so that education may produce balanced human beings.

More dangerous because more subtle and less obvious is another limitation of science, an attitude to the world which, if uncorrected, induces a cramping effect on the mind, which is a widespread weakness of our civilization, but is often unnoticed. (Ibid. p.80)

**The Dehumanization of the Scientist.**

Granted that intellectual curiosity is one of the most effective forces in the creation of science, the fact remains that the scientist's behaviour is determined to a very large extent by factors unrelated to the pursuit of science per se. One of these factors is the reward that intellectual curiosity can bring in the form of popular recognition. Even the withdrawn Darwin was willing to admit in his autobiography "My love of natural science has been steady and ardent. This pure love, has however, been much aided by the ambition to be esteemed by my fellow naturalists." According to Prof. Ludwig Edeistein, the slowness of the development of science in the ancient world can be traced in large

part to social indifference. Then, as now scientists found it necessary to make exaggerated claims to appeal to mystery in order to attract public attention. It must be admitted also that the satisfactions of intellectual curiosity are often contaminated with those that come from acquiring a sense of power and domination not only over nature but also over fellow scientists. History provides many examples of these unsavoury aspects of scientific life and so does daily experience in any of our institutions of learning. Conflicts over priority and personal jealousies have always been common at all levels of the scientific population, not barring such heroic figures as Newton and Pasteur. (Rene Dubos. The Dreams of Reason. pp. 136-137).

More difficult to recognise but equally important in the motivation of scientists is the fact that what appears as thirst for knowledge often could be regarded more exactly as kind of intellectual lust rather than a love of truth. " Most people who call themselves truth seekers do not so much desire to find the truth as to cure their mental itch " wrote Sinclair Lewis in Arrowsmith. Max Planck stated more recently, "It is not the possession of truth, but the success that attends the seeking after it that enriches the seeker and brings happiness to him."

The attempt to justify science only by its worldly products is fraught with dangers. Not only does it compromise the intellectual honesty of the scientific community. It also helps to foster among lay people a fundamental skepticism about and even contempt for science itself. (Rene Dubos. p. 144).

To be scornful of the ultimate intellectual and moral value of natural sciences is, of course, a very ancient attitude. Socrates' skepticism as expressed in Plato's dialogues, has its counterpart in the talk about the bankruptcy of science that was widespread in literary and philosophical circles at the beginning of the present century. Until recently, however, the attitude of the skeptics was not one of hostility but rather one of impatience and disappointment at the fact that, despite repeated promises, science had not yet solved for man the riddle of his nature and his destiny.

Along with admiration for and awe at the power of science, there exists among the lay public, as pointed out by Margaret Mead a curious mistrust of the scientist himself, as if he were something scarcely normal and human. The modern attitude toward the scientist is not far removed from that of primitives toward the shaman or medicine man, an individual regarded as essential to the group, but one who is feared and often hated.

Miguel de Unamuno (The Tragic Sense of Life. 1913) and Jose Ortega (The Revolt of the Masses. 1930) in their books recognise the contributions made by science to human safety and comfort. But while they appreciate the merits of aspirin and motor cars, they are very little impressed by the kind of intellectual process involved in the technology that has produced these conveniences. Most scientific thinking according to them, corresponds to a mechanical performance of a rather low order. In Umamuno's words " Science does not satisfy the needs of our heart and our will." Not only does it not deal with the problems of the real man " of flesh and bone " but it turns against those who refuse to submit to its orthodoxy the weapons of ridicule and contempt. Thus according to Unamuno and Ortega, the modern scientist is *thoroughly dehumanized*, with no horizon beyond his specialized techniques, no awareness of distant human goals. Science fails to

deal with the problems that are the real concerns of mankind, and furthermore, it stultifies all higher aspirations by fostering and satisfying the mass aspects of human nature. (Rene Dubos. The Dreams of Reason. pp. 144-148).

Rene Dubos points out that science is being introduced in the underdeveloped parts of the world not as a cultural pursuit, but merely as a powerful and convenient tool—at best to be used for the production of material wealth, at worst for destructive purposes. For this reason scientists and science writers betray a public trust when they neglect to emphasize the disinterested aspects of knowledge and are satisfied instead with claiming that all scientific discoveries eventually prove of practical use. In the long run the exclusive appeal to practical values may well endanger the future of science and its very existence. (Rene Dubos. The Dreams of Reason. P. 156).

The question of how to do things was a purely technical one that could be decided on scientific criteria, but the *choice of what to do*, among all the things that can be done, clearly implies some concern with ultimate social consequences. Unless the scientist becomes concerned with social philosophy, the scientist will increasingly hear the words of Oscar Wilde applied to him :-

> that he knows the price of everything,
> but the value of nothing.

Science is a humanistic activity to the extent that it is more than a body of facts and techniques and that it deals with material meaningful to the preoccupation of mankind. There are of course many specialists who are not concerned with the cultural, humanistic implications of science. But science should meet the requirements associated with the concepts of culture and humanism.

**Science and Religion—Is there a conflict ?**

Religion has played a vital role in the life of individuals and societies. Religious ideas and ideals have spread into all the fields of human activity and hence it was believed that religion was the key to the understanding of all human activities and culture.

But times have changed. Today religion is facing a crisis. It is threatened by communism on the one hand and science on the other. In the words of Karl Marx " Religion is the sigh of the oppressed creature, the heart of a heartless world, as it is the spirit of spiritless conditions, it is the opium of the people." (Karl Marx. Toward a critique of Hegel's Philosophy : Introduction. " Writings of Young Karl Marx on Philosophy and Society, ed. and trans. L. D. Easton & K. H. Guddat (Garden City : N. J. Doubleday—Anchor. 1967. P. 250). Science first of all banished religious categories of explanation from the field of spatio temporal events and it has shown itself able to give verifiable and useful knowledge of the significant factors operative in all classes of natural and historical events. It seems therefore to reveal better than any other mode of knowing what is both real and true in existence. And through its control over the enviornment, it seems to promise to men through the exercise of his intelligence an undreamed of ability and luxurious life on this planet. It is precisely " this-worldly " mood that has created most of the difficulties for religion.

In the West religious values have largely ceased to play a dominant role in the life of the individual. In its place Science began to exercise sovereignty over the hearts of

people. But the affluence and the miraculous discoveries by themselves have proved woefully inadequate to meet the aspirations of the people, especially the young. Millenia ago the seers of the Upanishads said wealth does not bring contentment to man. Dr. Radhakrishnan rightly points out that science has liberated man from much of tyranny of the environment but has not freed him from the tyranny of his own nature. (R. Radhakrishnan. Religion and Culture. Orient Paperbacks. Hind Pocket Books (P) Ltd., Delhi. 1968. P. 153).

Alfred North Whitehead in his book 'Science and the Modern World' says that "When we consider what religion is for mankind and what science is, it is no exaggeration to say that the future course of history depends upon the decision of this generation as to the relaton between them. We have here the two strongest general forces (apart from the mere impulse of the various sense which influence men and they seem to be set one against the other – the force of religious intuitions and the force of our impulse to accurate observation and logical deduction.

**How is religion related to science :**

Ever since modern science arose there has been confusion that often caused intellectual warfare between the exponents of science and of religion This warfare reached its climax with the publication of Darwin's Origin of Species in 1859. This antagonism was mainly because of the religious leaders feeling that science was undermining the beliefs of the faithful. Many scientists assume that the religious leaders stubbornly cling to their beliefs that science has shown to be untenable. But now in the middle of the 20th century we can now face the question of the relation of science and religion more calmly. Some now assert that our science and our religion need not be at loggerheads and that each can help the other to an enrichment of human life. The old warfare between them has largely disappeared For many religious leaders "creation versus evolution" is no longer an issue; nor is the question of the age or the shape of the earth or of the structure of the heavens. Science has forced the total reinterpretation of religious or theological truths in a new direction, namely an entirely symbolic truth, asserting something, to be sure, about the real but nonetheless non-assertive of matters of fact, of events in space-time – which area was now left entirely to the inquiries of natural science. Yet for many people science and religion seem utterly opposed or at least incompatible.

One can recognise two kinds of perplexity, first those that represent substantive disagreement and second those involving apparently incompatible or antagonistic attitudes. The former are characterized by the clash of contradictory teachings. Virtually all of the old issues of the warfare between science and religion were of this type. Now these old issues have been resolved and hence what formerly seemed contradictory now seens thoroughly harmonious and consistent.

For the most part of our generation it is not so much a question of specific contradictory teachings as of what seem to be incongruous attitudes and feelings, and conflicting purposes and goals. In large part these difficulties seem to arise from widespread misunderstandings as to the actual nature of science and religion, of their basic objectives and the methods they employ to achieve these, of their attitudes toward truth and freedom of inquiry and toward the needs of mankind. Both science and religion are commonly

thought of largely in terms of stereotypes that misrepresent their real nature. It is largely to these stereotyped images of religion and science that Harold K. Schilling ascribes the widespread notion that they must be basically incompatible or even inimical. Religion is said to have rigid creeds to which one must subscribe, whereas science does not. Religion is allegedly authoritarian, demanding unquestioning orthodoxy, whereas science is utterly free, recognizing neither orthodoxy nor heresy. We are told that the authority of religion stems fundamentally from 'so-called revelation' a mysterious process by which God is said to have transmitted historical, scientific and religious knowledge, contained in an inerrant Bible, that is unattainable by ordinary rational means, while that of science is based on evidence and reason, without appeal to anything as meaningless as "revelation" In religion one must take things by unquestioning faith inspite of the absence of proof: whereas in science one rejects everything not based on logical demonstration and experimental verification. No wonder science and religion seem mutually exclusive! No wonder many thoughtful people feel that it would be intellectually dishonest if one adhered to both. (Harold K. Schilling. Science and Religion, George Allen & Unwin Ltd., London, 1962, pp. 4-5).

There is another aspect of the matter of attitudes. Not only has there seemed to be opposition between the forces of science and religion, but there has been developing a feeling that they are mutually irrelevant to each other, intellectually and other-wise, and that they would both be better off if they paid no attention to each other. Of what good is religion in the pursuit of science? What positive contribution can it make to the growth of science? Perhaps, we have come to the point in history where religion is no longer an active opponent of science or a positive hindrance to scientific progress, but is it not still likely to be a dead weight causing retardation or a siphon drawing off the interests and energies of men from what is really important and urgent in the life of the world? And of what good is science to religion? What contribution has it made or can it make to the solution of religious problems - in view of its preoccupation with things and its amoral attitude towards values? May it not actually be a millstone around the neck of spiritual progress? (Ibid p. 5).

Thus it must be said about both science and religion that many representatives of each regard the other as banal and pointless, and even possibly harmful, in regard to what really matters in life and in scholarship. Nor is this feeling to be found only within the camps of science and religion themselves. On the one hand, as Edmund Husserl pointed out rather cogently in referring to what he called "the crisis of the European Sciences". the common man has for some time been asking rather dispairingly what the sciences have to offer aside from materialistic values in these times of great perplexity and anxiety. For many men and women they seem to have no answers to the questions that concern man most deeply. On the other hand the same charges are being made against the religions of the world.

Harold K. Schilling holds the view that science and religion are fundamentally not incompatible and inimical and that they are not irrelevant either to each other or to the greatest concern and needs of mankind. They are, of course, different in many respects, but not in such a way as to make them necessarily opposed or mutually irrelevant. Indeed in other ways they are remarkably alike—especially in those very aspects in which they

are typically regarded as—most incongruous, namely in their spirit, temper of mind and in their basic attitude toward truth and reason, and freedom of inquiry, as well as toward the spiritual, non-material necessities of life. Such differences as do exist, far from making them discordant or mutually exclusive, make them complementary and mutually helpful, and beneficial. Each is unique and each has something unique to offer. Each is enriched by the other. Neither is a hindrance to the other. We need them both in our culture and personal lives. Our world view and philosophy of life would be incomplete and unbalanced without the contributions of both. (Ibid. pp. 6-7).

Bertrand Russell points out that the conflict between theology and science was quite as much a conflict between authority and observation. He comes to the conclusion that there is however one aspect of the religious life, and that perhaps the most desirable, which is independent of the discoveries of science. and may survive whatever we may come to believe as to the nature of the universe. Religion has been associated, not only with creeds and churches, but with the personal life of those who felt its importance. He writes so long as religion consists in a way of feeling, rather than in a set of beliefs, science cannot touch it. Thus it is considered a private concern limited to the individual.

C. A. Coulson in his book Science and Christian belief asserted that on the basis of both of its actions and its search for truth, and of its mode of working and its presuppositions, science must be described as an essentially religious activity. However little its followers may recognise this, it is still true that science is " helping to put a face on God "; it is one of the ways in which He is revealed. To separate science and religion is completely and utterly wrong. Science is part of religion and the splendour, the power, the dynamic and the progressive character of science are nothing but the splendour and the power and the dynamic character of God, progressively revealed to us. (pp. 81-82).

C. A. Coulson asserts that science is a mode of God's revelation. A.N. Whitehead has put it " Every event on its finer side introduces God into the world."

Dr. Radhakrishnan writes that we should not only be specialists but also have a sense of the meaning of life and of social responsibility. We have to reckon with the spirit of science, understand its limitations and develop an outlook which is consistent with its findings. It is no use clinging to traditional forms which have lost their meaning. We cannot ignore the world of scientific achievement and withdraw into the inner life of contemplation. We are involved in the mechanism of the modern world and so should seek even religious truth not merly with our emotions but with our minds. We cannot go back on the scientific civilization. Nor can we drop religion. To reconcile the two is the task set to our generation. (Science and Culture. pp. 154-155).

The greatest thinkers in the East and West have felt the need for both science and spiritual life. Civilization is intended to make us aware of the creativity in us. The freedom of the individual should not be reduced to physical and spiritual slavery. The function of civilization is not to produce robots who carry out the directions of the dictator. As members of groups we do things which we will not allow ourselves to do in our private lives. Man has shown himself capable of indescribable horror. This is because man, the lord of all the elements, earth, air and water, hugs to his bosom notions which diminish his dignity and reduce his freedom to absurdity. Man the inventor and the vehicle of the great developments of science and technology has become a

problem, an enigma to himself. The problem can be solved only when we turn to the inner life of the individual. Immediate relation to Ultimate Reality is the basis of certainty which helps the individual from dissolving in the crowd. He will not then be swept by the drift of things. He will then choose that the creations of the human mind shall be a blessing and not a curse to mankind. If fear and anxiety are mixed with hope and assurance, it is because our natures have not become integrated. Under the influence of the universal experiences of religion and modern science and technology, mankind is being moulded into a single community. The common man has to discover what is uncommon in him and learn to live as a citizen of a world community. Science will triumph over ignorance and superstition and religion over selfishness and fear and nations will come together to build a great future for humanity, the brotherhood of man which has been the vision of the prophets since the beginning of time. (S. Radhakrishnan. Religion and Culture. pp. 159-161).

**The Ethical Basis of Science**

It has been said that science has no ethical basis, that it is no more than a cold, impersonal way of arriving at the objective truth about material phenomena. Bentley Glass in his book entitled 'Science and Ethical Values' challenges this view and writes that by examining critically the nature, origins and methods of science we may logically arrive at a conclusion that science is inescapably committed to standards of right and wrong and unavoidable moves in the large toward social aims. (Bentley Glass. Science and Ethical Values, the University of North Carolina Press, Chapel Hill, 1965, p. 69).

James B. Conant pointed out that the advance of medical sciences has made possible the mitigation of many types of human misery to a degree undreamt of a few centuries ago. The present status of medicine and public health is the result of the efforts of thousands of scientists over the last three hundred years. Admittedly many of these men were not motivated in the least by their concern with suffering humanity. Indeed, some were totally unaware of the fact that their work would throw light on the problems of the physician. On the other hand, in the last hundred years a great many investigators have been prompted by their desire to improve the ancient art of healing, not only physicians but chemists and biologists as well. A conscious effort on the part of many investigators to control disease, to prolong life and to alleviate pain has yielded results of a most dramatic nature. I should like to point out that the conduct of almost every individual who participated in this advance of science and progress in the art of healing was determined by a set of value judgments. These judgments were closely connected with the exhortation, "One ought to help the suffering". The conduct of doctors is regulated by a set of ethical principles which in themselves are based on value judgments. Conant emphasized the degree to which a judgment of value has determined the investigation of scientists or those seeking by empirical means to improve an art. Once again Conant makes the point very clear that those who say that science and value judgments are in separate compartments have failed to examine the nature of scientific undertakings and the motivation of many scientists. Conant concludes by stating that quite apart from what has been done to strengthen the hand of the Good Samaritan, science creates an atmosphere that encourages those who believe that man is not merely a social animal. The history of the last three hundred years is a record of accomplishment in the manipulation of ideas; it is a story of the flowering of the creative powers

of the human mind. In the present period of reaction, in the shadow of fusion and fission bombs, we do well to stress this aspect of modern times. (James B. Conant. Modern Science and Modern Man, Columbia University Press, New York. pp. 84-111).

Bertrand Russell concludes the chapter on Science and Ethics in his book entitled Science and Religion by stating that it is true that science cannot decide questions of value, because they cannot be intellectually decided at all and lie outside the realm of truth and falsehood. Whatever knowledge is attainable, must be attained by scientific methods; and what science cannot discover mankind cannot know.

**Religious Values and Science or Modernization**

The problem of modernization has engaged the attention of many economists of the developed as well as underdeveloped countries of the world during the post war period. Among these students many have started giving increasing attention to the non-economic factors underlying the process of modernization. One of these non-economic factors that has received attention is religion. Max Weber who was initially responsible for linking religion with the development of capitalism not only attached over-whelming importance to the role of protestant ethic, especially the Calvinist doctrines in the capitalist development of the Western world, but also traced economic retardation of the Orient to the religious beliefs and practices of that area. In Max Weber's study on 'Confucianism and Taoism' and 'The Religion of India', Weber tried to analyse the effects of Confucianism and Taoism on the 'economic mentality' of the Chinese people and the effect of Hinduism on the 'economic mentality' of the Indian people, respectively.

Gunnar Myrdal in his famous provocative treatise on underdevelopment of Asiatic countries entitled 'Asian Drama' advocates an institutional approach to the study of modernization. He points out that people's attitude to work and life, hardened by stagnation, isolation, ignorance and povery and under-pinned by tradition and often by religion are frequently found to be inimical to change of any kind.

Guy Hunter in his book 'Modernizing Peasant Societies' is of opinion that even deeper than politics lies the basis of religion, morals and education which can sterilize or fertilize human effort and give to society a unity of standards and values upon which a stable political and social system can be built. There needs to be a moral discipline and leadership without which no social action can gain the force and consistency needed for development. Both Hindu and African cultures are, in the main, religious, rather than moral, and they produce religious rather than moral societies. Morality, without a religious foundation tends to crumble; but religion without a moral guide to action is socially impotent. It could be said that both Gandhi and Nehru began to moralize India; that Nyerere and Kaunda are seeking to moralize Tanzania and Zambia. It is very literally from their efforts that their societies—Asia or African—begin to gain the power of purposiveness, sustained action. The discipline of daily effort, care and patience in the peasant farming of much of Asia gives a basis, in character, for a disciplined society—in Africa, with her rougher methods, this is not yet so widely spread. But this discipline has to extend—as it did once in Europe—to honesty, and thrift and loyalty in commercial and industrial life if a modern nation is to prosper. (Guy Hunter. Modernizing Peasant Societies: A Comparative Study in Asia and Africa, Oxford University Press, London, 1961, pp. 297-298).

In India the experience of the Five Year Plans has increasingly brought home to the planners the realization that traditional values and institutions play a vital role in accepting scientific outlook. The scriptive order in place of achieving status order, emphasis on the sacred and the 'other-worldly' mood, views of the universe as controlled by astrological, numerological, magical, animistic and other non-rational forces, and the resulting fatalistic attitude toward life, aversion to manual labour, conformity and ritualism, segmentary nature of the social structure, etc. are the major cultural problems affecting India's effort at modernization. Her basic value system has several elements that could initiate and sustain modernization, but India's institutional organization frame work comes in the way of development and growth.

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In the discussion of the paper at the Seminar, in the Seminar room of the Madras Institute of Development Studies on Thursday, September 28, under the chairmanship of Mr. R. Ramanujam, Professor of Economics, D. A. V. College, Madras, there was a wide ranging discussion on what Religion and its Values are, as the paper was quite explicit in the definition of science and its consequences. Religion was varyingly defined by the participants as a matter of faith, as embodied in Bhakti and Karma, as a way of life, as a set of ruled, established by our predecessors in the past. Common to all these approaches was the consensus that religion is an individual concern and that its definition would vary with each individual.

Religious values were also widely debated. They include, first faith and devotion in and to God. They involve obedience and observance of certain norms and values. They express themselves in various forms of action. In fact Karma as a value defies precise definition. They above all refer to brotherhood, sharing and charity. It was also pointed out that religious values have a negative aspect. They include various forms of superstition, though it is difficult to agree upon a definition of superstition because what is a faithful observance of a sacred tradition such as Rahu Kalam for one may be a form of superstition for the other. The interaction for religious values on our daily life today makes many religious norms a form of outworn ritual. Another negative religious value is the hierarchisation of men and societies into divinely ordained classes, castes and sub-castes with the ultimate degradation represented by the outcaste.

There was general agreement on science—its content, approach and methodology. Science deals with the known world of nature, it pursues the method of experimentation, it demands a spirit of objectivity and is engaged in a relentless pursuit and search. There was also agreement that one must distinguish clearly between science on the one hand and the use and misuse of science on the other.

There were sharp differences expressed on the relationship or lack of relationship between religious values and science. To some participants the two belong to two different universes with little relationship between them. In our country religious values are among the major guide to life for 99 per cent of our people, who know no science. That is one universe, the universe of religious values. There is the residual one per cent of our people belonging to the upper and middle classes who have had the benefit of scientific education and who in their thought and life reconcile in various ways science and their

religious values. But this small universe of one percent of our people is all that science represents. The two universes have nothing to do with each other and when we talk of Science and Religious values we are talking of only one percent of our people. Another expression of this differentiation is that of two separate universes of discourse. Religious values belong to the universe of the individual. Science belongs to the universe of society. The two are separate.

As against such separation, it was pointed out that there is a contemporary view of religion expressed by such religious leaders as Krishnamoorthy, wherein science is completely equated with religion. In this view, religion and science not only cannot be separated but are coincidental. This kind of identification of religion and science established in India by Radhakrishnan and Vivekananda has been established in the West by the scientist-philosopher Taillard-de-Chardin. The paper is incomplete as no reference has been made to his great contribution. It was suggested that two more papers should follow this discussion, one on Religion, Politics and Power and the other on the Religious Mind.

The practical conclusions were also a matter of divided opinions. Those who held the view that Religious Values and Science are two separate universes which must and will co-exist peacefully and otherwise, felt that when science has the same run of 5000 years which religion has had, it will be part of the values of the 99 per cent universe. In the meanwhile the propositions that this position gave rise to are: that at present only unscientific societies are religious societies, that affluent societies are scientific societies and therefore that our task in India was to fight poverty in all forms so that our society might become an affluent society and hence a scientific society. Some, while arguing with this practical approach of working to uplift our poor majority, warned that religious values exist independently and themselves need in some cases of change and reform.

To those who held the view equating science with Religious Values, the above conclusions were not acceptable. It is not only unscientific societies which are religious societies. Indian society has through the ages been both scientific and religious. In this view the paper is wrong in tracing the history of science from the middle of the 18th century. That is because the paper relies almost entirely on European writers. Also until we came under the colonial rule, Indian society was an affluent society, which demonstrates that religious values, Scientific temper and affluence can exist together. This group also agreed with the practical conclusion that we must now devote ourselves in the country to the anti-poverty battle and use the contemporary definition of religion and science as a means of promoting affluence.

# GROWTH : ITS IMPERATIVES AND LIMITS *

*Growth*: Growth is for us an imperative. I mean by growth a steady and continuing increase both in our total production and in our per capita income so that our traditional ideal of sufficiency for each family is attained. In such a description of growth for us in India, I distinguish sharply between our goal which can be summarised in the slogan, 'sufficiency is sufficient', from that of the affluent countries of the West where growth is based on the axiom, 'sufficiency is not sufficient'. For us the growth problem is still the classical economic problem of limited resources pressing against large, growing, unmet wants, a problem which demands not only that our economy be made to stand on its feet but march forward steadily. For the affluent countries the problem is the other way around—that of rapidly growing resources pressing against limited wants. It is in such countries that the economy needs to be stood on its head, to slow down its irreversible march forward and ensure that with the pace of change in the pattern of people's wants, increased resources per capita involve increased welfare.

*Definition*: As a country, we averaged an annual growth rate of our national income of 3 per cent during the sixties. Our per capita income during that same period rose by 0 6 per cent. Our absolute per capita income at the end of the sixties was Rs. 135.06 in 1960. Here I have used three quantities—national income, per capita income and the rate of growth. Let me say a word about each. The size of the national income and the per capita income are indicators of growth. This is so if we bear in mind some of the unique features of our country. Of 133 independent countries today, we are the seventh largest country in area with 3.268 thousand kilometres, coming after the USSR (22,402), Canada (9,976), China (9,561), the United States (9,363), Brazil (8,512) and Australia (7,687). Even so we are the second most populated country with 569.5 millions, following China with 772.9 millions and followed by the USSR and USA with 245.0 and 207.1 millions. Incidentally while our population is growing at the rate of 2.3 per cent per annum, that of China is growing only at 1.5 per cent. In international computations and comparisons our country is shown among the nineteenth group of countries (among 25 groups) with a per capita income at factor cost of $ 110, which is more than Rs. 800 [1] whereas our official estimate to Rs. 135.06.

The use of national income and per capita income as indicators of growth is acceptable if their limitations are not lost sight of. First there are the usual statistical problems and resulting imperfections arising from unreliable, incomplete, and in some cases absent information. In a Country as large as ours with a majority of illiterate people, the methodology of primary data collection and the possibilities of distortions must be allowed for. A second problem is the equation of the money incomes with real incomes. We know what Rs. 135 means in terms of goods and services in our Country. Even here, it means quite a different bundle of goods and services in the cold north from the warm south, in the cities of Bombay, Bangalore and Delhi from the villages and hamlets of Mysore or Madhya Pradesh. And when we try to express them in some

1 World Bank Atlas: International Bank for Reconstruction Washington 1971.

* Extracts from the sixth J. N. Tata lecture by Dr. Malcolm S. Adiseshiah at Bangalore in September

common world currency as done above in the United States dollar, for inter country comparisons, there are additional limitations. The dollar figure used is an attempt to express our income on the basis purchasing power parities. In 1959 for example the per capita income of a U.S. citizen was 30 times that of an Indian on the basis of our exchange rates. On the basis of the relative real purchasing power of our two currencies, the difference was, however, 12 times. It is right that we use the latter figure because the exchange rate of Rs 7.30 (Rs. 5 at that time) to the dollar rests on two rather special factors. It is the relationship between the rupee and the dollar connecting our internationally traded goods and services, which constitute less than 10 per cent of our total production and consumption in the Country. Further the exchange rate assumes that our total exports pay for our imports which they do not, and that our two price levels are stable, which they are not.

But the most serious problem in using national income and per capita estimates as indicators of growth, the growth of the welfare or illfare of the people of the country, is that it really tells us little about their levels of living. The United Nations has defined levels of living as comprising nine components: health, food, consumption and mutrition, education, employment and conditions of work, housing, social security, clothing, recreation and human freedom. Even if we take the quantifiable components of this definition, the estimates that we have been using with all the caveats tell only part of the story. We know that at 1960-61 prices if a person spent Rs. 182 a year in our villages and Rs. 236 annually in our towns. he should be consuming 2,200 calories per day and having some housing and clothing [2]. This means that our total income even if divided absolutely equally between all of us. 569.5 millions, living in the country, will give each person Rs. 135.06 and not lift him above the poverty line. What it does not tell us is that our total income is so distributed that about 50 per cent of us are living above the poverty line as I have defined it, at varying distances from it and that 50 per cent are living below it. Two tentative conclusions that suggest themselves at this point are that our total income must grow by some 40 per cent at the present population level so that our goal of sufficiency for all may be reached. Second that growth must first ensure that 50 per cent of our people who live in the poverty sector have their incomes augmented by atleast 30 per cent.

*Our Growth Rates* : How then do our total income and total production grow? This concept of the rate of growth of the economy is borrowed from biology and traces back to one of the conclusions of the founders of the science of economics, that the Mecca of the economist is economic biology rather than economic dynamics [3]. The rate of growth involves comparisons over both time and space. It involves not only a comparison between periods of time in our country but also between our country and others, preferably at similar stages of development and/or having similar structural features, for that same time series. In neither regard are we doing very well. During the sixties as we have seen our national income grew at 3 per cent, while that of other developing countries in a position similar to ours registered a growth rate of 4.7 per cent. The United Nations which is us and countries like us in its First Development Decade which that period represents, had set a target growth rate of 5 per cent. We were far

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2. Poverty in India—N. Dandekar and U. M. Rath
3. Principles of Economics—A. Marshall Macmillan—London 1932.

from attaining the agreed target. We started off the seventies very well with a near doubling of our growth rate to 6 per cent in 1969-70 but slid down to 4.7 per cent in 1970-71 and further down to 3 percent in 1971-72, while the target that we set for ourselves in the Fourth Plan is 5.5 per cent and in Second United Nations Development Decade is 6 per cent. At the rate we are going, I have an unhappy feeling that we will end this year with around one third the Second Decade target.

Our per capita growth rate record is even more dismal,-more dismal because our slow growing total product has had to be divided among a larger number of people. If our census figures are to be believed, we very nearly doubled our rate population growth as between the fifties when it was 11.85 per cent and the sixties when it shot up to 22.01 per cent. It is not surprising therefore that our per capita GNP has crawled along at 0.6 per cent per annum during the sixties, the international comparative computation [4] giving us, for reasons that I have earlier explained, a per capita growth rate of 1.1 per cent. Under the same computation, China is shown to have had a 0.8 per cent annual GNP per capita growth, Pakistan 2.9 per cent, Malaysia 3.8 per cent, Thailand 4.7 per cent, North Korea 5.9 per cent, and South Korea 6.4 per cent during the seventies. My conclusion is that both absolutely and relatively India's growth performance is among the poorest in Asia.

*Industry*: What are the causes for our poor growth performance? The major cause is the steady decline in the growth of our lead sector—which is our manufacturing, mining and quarrying. Manufacturing which grew at 6 per cent in 1969-70 declined to 3.5 in 1970-71, to 3 per cent in 1971-72 and is likely to be around 1.9 per cent this year. We may quarrel about the precise rate of our industrial deceleration. The official index shows a 1970 July-December decline of 0.5 per cent compared to the first six months, while the Economic Times index shows a 0.9 per cent decline. This is the difference between twiddledum and twiddledee. Both are twiddles. The deceleration is a fact. But how important a fact is it? After all the contribution of manufacturing activities to our total product in the Country is around 20 per cent and within that small share that of the organised sector is around 7 per cent. To further confuse the issue we know that both last year and this year 37 groups of industries did perform well. Large increases were registered in 8 groups, wood and cork manufactures, electrical machinery, metal and rubber products etc.—moderate increases in 19 groups including machine tools, scooters, typewriters, tyres and tubes, nitrogenous fertilisers etc., and in 10 groups such as newsprint, polyester and nylon fibres, electrical steel sheets etc. production was maintained. Why then is the decline in the industrial growth rate crucial? First because industry is the base for so much of our production through its linkages and link effects through the economy. The sharp decline in production has taken place in a number of key manufactures with unused capacity and fixed product prices, as in steel, cotton textiles, leather products, engineering products and transport equipment and their linkage circular depressing effects on the raw material input situation for a whole host of industries, and their ancillaries make for the deceleration trend noted. Second this is the lead sector because it is here that the output per capita has occurred without an increase in manhours worked per capita. It is in this sector that the growth in output per hour of labour is higher than the total product growth for the economy. In other

4. See footnote 1.

words it is manufacturing industry through productivity increases due to the technology and skill factor which is the pace setter for the economy's productivity. In the euphoria generated by our unbroken series of bumper food grain harvests over the past four years, and in contrast to agriculture's good performance compared to that of our manufactures, we tend to overlook this crucial issue, that the output per man hour worked in agriculture has not only not increased for the Country as a whole but has actually declined. But more on this later. Third the industrial sector is for the economy an important source of savings, capital formation and investment. Such development investment is the basis for the growth and health of the economy. During the last year, while the private sector continued to contribute its less than 9 per cent to the total investment effort, the public sector has not only not contributed to the savings target, in some cases its returns have not been adequate to cover its depreciation costs.

*Agriculture :* The growth performance of our agriculture sector is more heartening. Food production has continued for the fourth year running to grow at a rate well above 6 per cent overall, with 9-10 million tonnes in buffer stocks. Our problem today is effective storage rather than adequate supply, selective exports rather than shortages following from stoppage of PL 480. Within this heartening picture, are several problems. First this year's droughts and floods which have destroyed 50 per cent of our kharif crops have caught us napping, while we ought to have known and prepared for them. Instead of boasting about our green revolution we should have used the four year respite to exploit our ground water resources. Second we have an Agricultural Prices Commission but we seem to specialise in rejecting its recommendations in the matter of procurement and issue prices so that the tax payer continues to subsidise this growing sector to a point where our export surplus is not marketable because it is non-competitive in terms of the landed price in Asia or Latin America of American or Australian wheat. Another problem area is the continued shortages in commercial crops, sugar, cotton, oil seeds to which unfortunately jute should be added this year, alongside of the continued deficits in our pulses production and dairy farming which have a direct correlation to the grave problems of malnutrition faced by the majority of our people particularly in the poverty sector. Finally the output per worker in this key sector continues to be low and tends to decline. While agriculture contributes 40 per cent to the total production of the country, it employs over 50 per cent of the total work force. In my State where agriculture and allied activities contribute less than 9 per cent to the total National income, 42 per cent of its work force is engaged in agriculture, self employment and household activities. This illustrates very simply the low level of agricultural productivity, of output per worker both absolutely and relatively to the national or industrial output per worker.

*Services :* The growth rate of the tertiary sector which is a grab bag, comprising commerce, transportation, communication, health and community services, private and public administration, education, research and technology is growing phenomenally, and I have very mixed feelings about this startling phenomena. On some parts of it—those relating to transportation, communication and health, which are the essential infrastructure to our primary and secondary sectors,—I only wish there was a faster growth rate and not the stagnation that we witness in the last and current plan periods. In the case of science and technology, on which we are spending somewhere around 0.2 per cent of our per capita GNP at the 1960 Rupee, we occupy the second lowest position among some

sixteen selected countries of Europe, North America, Asia and Africa[5]. Within this rather lowly spectrum of research expenditures in our country, the non-governmental expenditures are even more lowly, constituting less than 0.1 of their investments in the Country[6]. But in assessing our research contribution to growth, it is not the volume or level which is decisive but its nature and results. The government sponsored research contribution to our industrial technology is around 0.13 per cent. Through our technical collaboration agreements which we are concluding at the rate of 5 per week, our technological dependence is glaringly evident. It is my hope that the transfer of the scrutiny and approval of foreign collaboration agreements from the Directorate of Technical Development to the National Council on Science and Technology would lead to a measure of technological self reliance, through making our government financed research programme technologically productive and reducing the lazy reliance of the private sector on imported know-how. So far as our educational system is concerned, I will content myself with the ex-cathedra statement that it represents today a dismal area of dysfunctional disinvestment, making little contributions to growth. There is then left the services particularly in the public sector which record an alarmingly high growth rate and which make no contribution to the growth of the economy.

*Capital Formation* : The growth rate of the primary, secondary and tertiary sectors of an economy is dependent on the growth rate of our savings and capital formation. Savings are the part of the income which individuals, corporations and government do not use for consumption and are reflected in output use as capital formation. Here a distinction should be made between national capital formation which is the total savings by the country, domestic capital formation which are additions to the country's capital stock financed from savings and foreign aid and net domestic capital formation which subtracts from the gross amount the depreciation and use of capital during the year. I shall use the movements in gross capital formation or gross national savings as an index of growth because they include the use and replacement of capital which are a significant element in productivity. I have a strong suspicion that under the pressure of rising costs, fixed product prices and falling gross returns, many of our key capital intensive industries are not making provision for capital depreciation and the necessary modernisation. For our Country, the time series of the gross domestic capital formation shows a steady growth over the past five years because of the increase in foreign aid. At the same time the gross national capital formation or the gross savings of the country over the same time series shows a steady decline from around 11 per cent to 8 per cent. The major cause for this decline is as noted earlier the dissavings of public sector which show a net loss of Rs. 3.37 crores for 1970-71, while the household and private sector savings have also fallen. It is an appalling thought that 91 percent of our total income is used up in private consumption. This has meant that over 55 per cent of our capital formation has been in the consumption industries and over 50 per cent of that has been in luxury goods production. A major growth imperative is for all four groups, households, governments, public sector and private institutions including agriculture to move up to the level of 12 per cent for gross national capital formation immediately and on to 20 per cent by the end of the Fifth Plan, if our declared policy of self reliance is to become a reality.

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5. Let My Country Awake—Malcolm S. Adiseshiah Unesco Paris 1972
6. Research Technology and Industry. Economic & Scientific Research Foundation, New Delhi 1965.

*Foreign Trade* : The growth rate of our foreign trade is the other important factor. The Second Decade target which we helped to set is an annual increase of our exports by 8 per cent and imports by 7 per cent. The Fourth Plan growth exports target of 7 per cent is nowhere near attainment. There is a series of confusing figures reported for the last two years by the Ministry of Foreign Trade, the Ministry of Finance and the Reserve Bank. The reality is likely to be a growth rate of 2 per cent for last year, (the official figure just released is 2.1 per cent) and 5 percent for this year. The mid-term appraisal document tells us that we face a shortfall of over Rs. 400 crores a year in our external accounts during the last three years of the Plan. The major declines in exports have been in iron and steel, ferro manganese, ferro alloys and ores. Engineering export promotion which faces steel shortages and the shipping bottleneck can be ensured through capacity steel production, selective steel imports and a revision of the export tariff. The moral is obvious in terms of export promotion, reordering of plan priorities vis a vis their import content and import substitution.

*Distribution* : I have so far dealt with the imperative of increasing the growth rate of the economy which is the problem of resource allocation aimed at equating the marginal value of every one of our resources to its price, where growth is the constant and continual movement to that optimum allocation at which the price of every good is equal to its marginal cost. I have so far abstracted from the second imperative of growth with which I started—that of income distribution, that the growth rate must first ensure that the people living in the poverty sector are lifted out of it. This dichotomy is wrong because increasing growth and the anti-poverty effort is our single simultaneous commitment and optional resource allocation and income distribution are inseparable. Every resource allocation whatever the summit reached has a pattern of income distribution and only under what are unrealistically called constant cost conditions, can the distribution pattern not affect the allocation and optimal production of goods and services. This means that the anti poverty aim of the growth imperative for us involves first a new style of production. It involves increasing emphasis on labour intensive technology and industrial and commercial activity, as the high yielding variety programme is, being both capital and labour intensive; it means a rural works programme which is assets creating and is within the Plan frame. Let us not forget that the most intensive and successful labour intensive technology invented was that by the Pharaos in building their picturesque Pyramids. The second growth imperative means designing and providing for self-financing within the Plan, all varied forms of self employment so that employment in our land ceases to mean just paid employment, that is receiving from someone else a pay packet at the end of every week or month. It means bringing the new technology and timely distribution of its inputs to the small farmer, the marginal farmer and the dry farmer who constitute 60 per cent of our farming households. It means a reorganised agrarian structure involving a real and effective system of land ceilings, security of tenancy rights and regulation of the status, incomes and wages of share croppers and landless agricultural labourers. This is what I call a new style or mode of production which is growth oriented, because we know that the new technology puts the large farmer and the small farmer on a footing of equality from the point of view of the net return per acre of farm land. And there has to be some reordering of our production growth so that there is a mass production of wage-goods, cereals, coarse cloth, kerosene, sugar, edible oil and housing materials, needed by the poverty sector which also will cut back on some of our import components based

luxury products. There is need for a distribution net work which will deliver the goods and services to the poverty sector. These services include potable water supply, health care, protein enriched foods for our vulnerable groups, family planning services and functional education.

*Imperatives:* It is against this double growth imperative analysis that I propose that the Fifth Plan aim at the simultaneous objective of doubling the per capita real income of the 50 per cent of our people in the poverty sector and a 7 per cent annual average growth rate. For this the last two years of the Fourth Plan should move to the 5-6 per cent rate, with agriculture continuing its 5-6 per cent growth to be extended to the dry areas, commercial crops and pulses, manufacturing and mining moving up to 9 per cent in the last two years of the Fourth Plan and to 12 per cent in the Fifth Plan, which will involve a planned programme of imports of equipment, components and capital goods. This will help our exports to move up to the 8-9 per cent target for the Fifth Plan, terminating the trade gap before the start of the Plan, and involving some drawing down of our not unsatisfactory foreign currency reserves of $ one billion. Fiscal and credit policies which match such programmes must arrest the current inflationary spiral, allowing for no more than a 2 percent annual price rise.

*Limits:* Now for the limits imposed on us by and for the growth imperatives that I have outlined. The first limit is with regard to the rate of population expansion—the present rate of demographic growth of 2.3 per cent means that we will have double our numbers by the beginning of the 21st century, which is only 28 years away. This growth rate brings our per capita income down, whatever may be the magnitude of our total product. It means less food, clothing and housing and more schools, colleges and hospitals. It is sometimes said that slowing down our birth rate from 35 per thousand to 25 per thousand which is our aim in Tamil Nadu will not help the Fifth Plan. It is true that the children who will enter school in 1974-75 are already born in 1967-68, that the labour force entrants who are now entering the work force at the rate of 1,20,000 per week are already born in the fifties and no vasectomy, no IUCDs, no condomes can reduce their numbers. But with less births, the individual families will have two or three mouths less to feed, the maternity and child welfare clinics can turn to be preventive and nutrition counselling rather than concentrate on curative and malnutrition combatting. Population control is a State policy prerogative but the planning of the size of the family is the individual family's rightful decision. Such policies and family decisions are frustrated by our mass poverty. I was in New York on 10th December, 1965 when the whole area suffered an electric power black out from 7 p.m. to 7 a.m. I was again in New York exactly nine months later on 9th August 1966 when the hospitals reported a doubling of the number of babies born compared to the previous year's averages for that day. I realise that rural electrification is a much more effective method of family planning than any of our conventional or non-conventional contraceptives. But we are poor and we must attack on both fronts—push growth in our economy and stop growth in our families. And in the end the limits to population growth are not economic or material. We will produce enough food to feed our growing population, we will build schools to teach them and create jobs to employ them. What we cannot do is to help solve the moral problem that the population explosion causes. When I left India immediately after partition, we were a little over 300 million. I have now come back home, and find that I have double the number that I can cheat, lie to, and corrupt, that I have double the number to love and be compassionate to. In other words I have twice

the opportunity to do evil or to do good. And I thank my stars that I will not be alive to have to stretch my vials of charity and compassion to four times that number in 2000 A.D. For me, it is this moral dimension which imposes the limits to my family expansion and to our population growth.

In fact the Club of Rome scientists[7] forecast that if the present exponential growth trends in world population, plus pollution accelerating industrialisation and resource depletion continue unchanged, the limits to growth on this planet will be reached within one hundred years. Here I would recall that our goal in India is sufficiency, not more and higher productivity, our growth imperative is a function of sufficiency and not a corollary of a growth mania. And so the Club of Rome scientists tell us that it is possible for the affluent nations to alter their growth trends and establish a condition of ecological and economic stability that can sustain and safeguard this future. Stockholm was the first of many rendezvous which will have to translate this prospect into a programme, for the affluent nations have come to a growth impasse where technological innovations which give them material leaps forward increase the risks of obsolescence and hence] their anxieties: where speedier means of communication swiftly isolate their peoples: where increased mobility results in more hours of commuting: where more televisions lead to less communication: where in sum more of everything means less of humanity and the human community[8]. These pleadings have a double moral for us in India. Our growth depends on the stability and well being of the affluent and the not so affluent nations. We stand to gain nothing, perhaps lose everything that we are building, if Euro-America heads in the direction that its best thinkers and seers are pointing. Hence it is for us first a call to understanding their predicament and a call to cooperation in the slow movement to a non-growing society, the Stationary State which the founding fathers of economics portrayed. Such a state will maintain capital plant and population in constant size, keep to a minimum all input-output rates of births, deaths, investment and depreciation and set the levels of capital and population and the ratio of the two in accordance with their values.

There is another lesson to us in this turn around—the limits to the nature of our growth—which we can now take in hand and correct. There must be a limit to the thoughtless destruction of our flora and fauna, to our unsafe drinking water, to our unhygienic living traditions, to our excessive use and misuse of fertilisers and pesticides, to erosion of our forest resources through false land hunger and reliance on fire wood for our ovens, to the industrial effluents poisoning our rivers and lakes, to the unregulated factory and automobile smoke and gases polluting our air. These limits must now be expressed in both public opinion, agreed legislation and more. For me, the limit to the misuse of science and technology is more science and more technology.

Growth is an imperative and as a limit is Man—Man with his endless capacity to innovate, err and overcome. The demand for plain living and high thinking, for economic simplicity and material sufficiency, for unrelenting austerity and unlimited generosity ingrained in our thought and history became the Humanism of Gandhiji. The imperatives to growth and its limits are a call to us once more to humanise our development process.

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7. The limits to growth: Potomac Associates—Washington DC
8. The costs of Economic growth: E. J. Mishan — Penguin Middlesex 1967.

# BOOK REVIEW

*Cooperative Tea Factories in India*

by

A. R. SAPRE and K. CHELLAPPAN,

*Vaikunth Mehta National Institute of Co-operative Management, Poona—1972.*

This report is topical for Tamil Nadu. In the last issue of the Bulletin, the effective functioning of 9 cooperative tea factories and the starting of the tenth was referred to, together with the government's decision to start a few more such factories. Despite its title, the report deals largely with Tamil Nadu because of the 10 cooperative tea factories studied, 8 are in Tamil Nadu. In fact as at March 1971 when the survey was made there were only 11 cooperative factories in all of India. The reason for this concentration is that Tamil Nadu has the largest number of small planters out of the 8 States where tea is grown—5974 who own below 5 hectares plus 327 who own 5 to 50 hectares compared to Assam and Bengal who have 17 and 6 in the first group and 108 and 12 in the second group. There is no standard definition of the small tea grower. Tamil Nadu treats all who hold 10 acres and less as small growers. The study pleads for adopting the Tea Board definition of those who own 50 hectares or less (which is 12 times the current Tamil Nadu definition) as small tea growers and on this basis recommends the setting up of 9 more cooperative tea factories. The most interesting part of the study is on the question of cooperativisation of small tea production. The theoretical case for it is well made. It secures the small grower a higher price for his product (in Tamil Nadu at anywhere between 30-40 paise per kg. more than from the private trader), it can provide him with a regulated market, it receives and distributes fertilisers to members, It can provide warehousing facilities as well as extension services. In this State these services are provided or planned to be provided not by the cooperative factories but by the Central Service Society called the Nilgiris Small Tea Growers Industrial Cooperative Society, "INCOSERVE", set up by the government to guide and coordinate the 10 factories in Tamil Nadu. But the case for cooperativisation in the real sense of the term does not emerge for an analysis of the findings of the report. The Tamil Nadu cooperative factories, it is pointed out, are really part of the government structure. Their Boards of Directors are all nominated by government—and will be for 18 years. All the factory officers are government servants, the chief executives being Assistant Directors, Department of Industries and Commerce. "The government of Tamil Nadu," concluded the report "has not encouraged the development of democratic practices in the cooperative movement" and goes on to suggest that in this Tamil Nadu can learn from Maharashtra. But Maharashtra cooperative experience shows the same record of mismanagement, favouritism, low capacity production and losses that are to be found in the two other cooperative tea factories that the study covers. The Teekoy Cooperative Tea Factory in Kerala is run on cooperative lines, uses only 25.59 per cent of its capacity, has a high cost of production, fixes green leaves prices on a subjective basis at less than half of the prices of Tamil Nadu, and has to date not paid any instalment on the Rs. 3 lakhs loan from the Tea Board. The

other factory—the Bir Cooperative Tea Factory in Himachal Pradesh, also run on true cooperative lines and has the same record. It has been constructed on a huge Rs. 5-6 lakhs loan, fixes the prices of green tea leaf at varying rates, utilizes only 27.16 percent of its capacity, produces at a cost well above the selling price in every year except 1970-71, and is in a state of chronic deficit. On the other hand the Tamil Nadu cooperative tea factories which are government controlled and managed, produce nearly 10 percent of Nilgiris tea, account for 4 percent of all South Indian exports, maintain a cost structure which is competitive with private factories, and show a high rate of profit during the years of functioning, which has to be set off against their backlog of losses due to the long time lag between securing loans and using them. The moral of this major issue concerning cooperativisation is that we have yet to develop a cooperative structure in the production area which can reconcile wide ranging participation and control by members with honest and efficient management.

The study's other suggestions are useful and appropriately documented. There is a case for widening the definition of the small planter to cover estates below 50 hectares. On this basis there is need to start some 15 more factories in the Country. For Tamil Nadu, widening the definition of a small cultivator beyond the present 10 acres is less important than the complete coverage of all 10 acres and below planters. At present only 30 per cent of small growers are in the cooperatives and as the factories are working to full capacity, there is need to start more factories. In this regard the government decision to start new factories is timely. There is need for an export centre to be established in the Nilgiris, so that Tamil Nadu tea exports do not need to be sent to Cochin. This would also stimulate export production. The employment potential of the factories is limited and this should not be tampered with. If the factories are made to carry a large and unneeded labour force, they will not be able to serve the small planter in terms of purchase price, low costs and efficient extension services. The good start made by INCOSERVE in marketing, the report points out, should be further expanded by providing its members with tea testing, evaluation and market trends studies, advise on product mix and some R and D work in cooperation with UPASI. This is a useful study. It brings together the results of an on the spot survey of an important sector of the economy and for this the V.M. National Institute of Cooperative Management should be congratulated. A.J.

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St. Louis Institute Press, Canal Bank Road, Adyar, Madras-20
Editor : Dr. Malcolm S. Adiseshiah